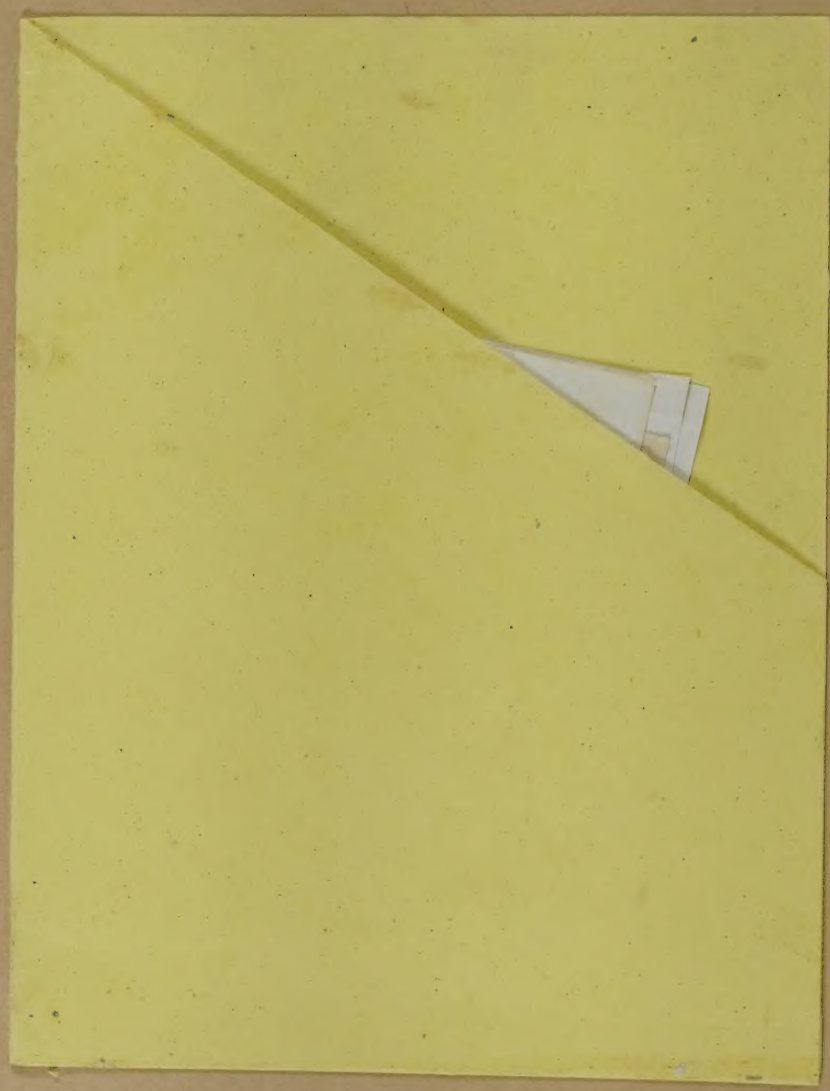


WORLD HEALTH ORGANIZATION  
EXPANDED PROGRAMME ON IMMUNIZATION  
**TRAINING FOR  
MID-LEVEL MANAGERS**

**CONDUCT  
VACCINATION SESSIONS**









03 .

COMMUNITY HEALTH CELL

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CONDUCT VACCINATION SESSIONS

October 1980

02

CH 131



## CONDUCT VACCINATION SESSIONS

### Introduction

As a supervisor of vaccination activities, your objective is to reduce morbidity and mortality caused by the diseases which your health care system has chosen to prevent by immunization. It will be your responsibility to schedule vaccination sessions and to ensure that they are conducted properly.

This module describes all the tasks which must be performed in order to conduct a vaccination session. Even though health workers have many other responsibilities in addition to performing vaccinations, only those tasks which are related to conducting vaccination sessions are presented here. No programme, however, can be so limited that a child who is sick or malnourished is vaccinated and then sent away without receiving treatment or advice. Therefore, the tasks described here are to be coordinated with and performed in conjunction with the other tasks that health workers perform.

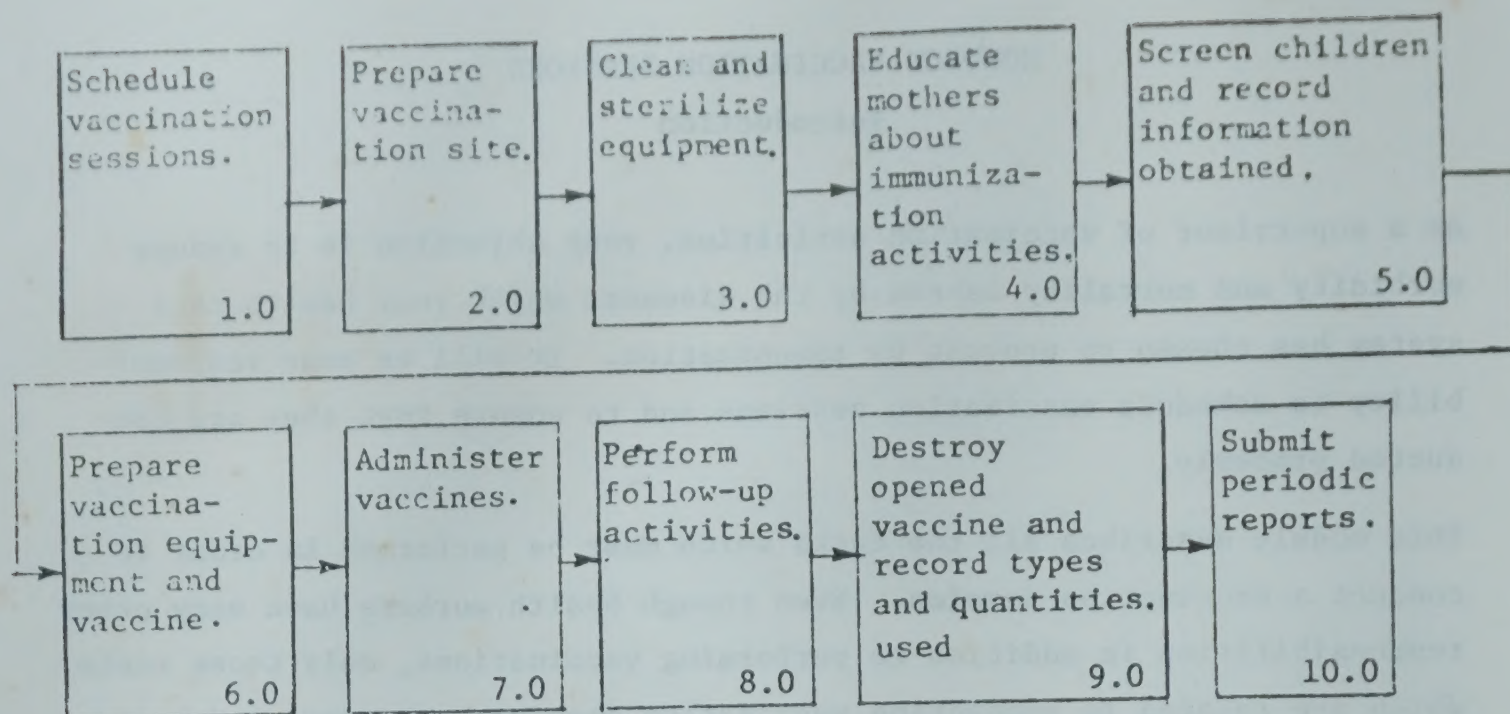
### STATEMENT OF PURPOSE

In this module, you will practice skills that will enable you to 1) plan a vaccination sessions schedule which is practical and effective, and 2) successfully conduct a vaccination session.

### FLOWCHART

On the following page is a flowchart of the tasks which must be performed in order to conduct a vaccination session. Each block (□) represents a major step. Read the blocks from left to right as the arrows indicate, starting with block 1.0. If you have any questions about the flowchart, ask a Course Manager for help.





These duties will be presented here in two ways:

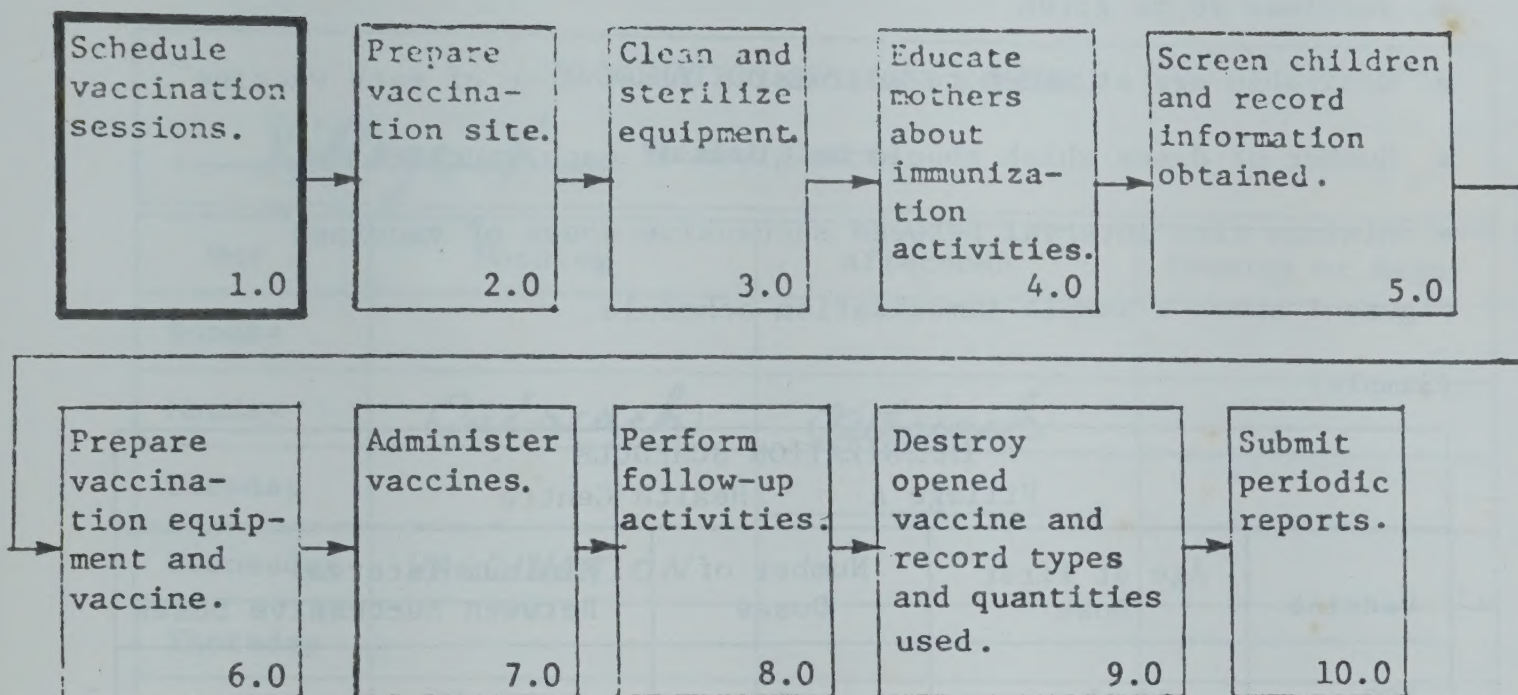
1. TASK DESCRIPTIONS of all of the steps to be performed in order to carry out each major step shown in the flowchart above. Task descriptions describe what must be done.
2. JOB DESCRIPTIONS which clearly describe the tasks to be performed by the staff member assigned each position. Job descriptions describe who will do the work.

Each task described in the task descriptions must be included somewhere in a job description of an individual staff member. Otherwise it will not be clear who is to perform which tasks, and some steps may not always be performed, or may not even be performed at all.

It will not always be possible to perform vaccination tasks exactly as they are presented here. This module describes one way that vaccination sessions might be conducted. Sessions may be conducted in the same way in programmes which are operated under similar circumstances, or the material presented here may be adapted for the specific needs of programmes which are operated under different circumstances.



## PART I: TASK DESCRIPTIONS



### 1.0 SCHEDULE VACCINATION SESSIONS.

Proper scheduling is essential if immunization activities are to be successful. Vaccination sessions must be on days and at times and places that are convenient for mothers so they will be able to bring their children to be immunized.\* Also, the sessions must be held frequently enough so that the number of children brought to each session is not so large that mothers have to wait for long periods or that the staff will not have time to vaccinate all of the children. Finally, the sessions must be held at appropriate intervals so that the children will receive the intended benefit from each set of vaccinations.

There are two types of schedules associated with an immunization programme: 1) IMMUNIZATION SCHEDULES and 2) VACCINATION SESSIONS SCHEDULES.

An IMMUNIZATION SCHEDULE contains information to which the health staff may wish to refer when deciding which immunizations to administer to

\*"Mother" will be used to designate the person bringing the child for immunization, although it is recognized that other persons may perform this function, and "child" will be used to designate each person who is vaccinated, even though women will sometimes be vaccinated.



a child. Specifically, an IMMUNIZATION SCHEDULE contains the following information:

- Vaccines to be given
- Desirable age at which to administer first dose of each vaccine
- Number of doses which should be given of each vaccine
- Minimum time interval between successive doses of vaccines \*

Figure 1 shows a sample immunization schedule.

(Sample)

IMMUNIZATION SCHEDULE Village A Health Centre			
Vaccine	Age at First Dose	Number of Doses	Minimum Interval Between Successive Doses
BCG	Birth	1	---
DPT	3 months	3	1 month
Polio	3 months	3	1 month
Measles	9 months	1	---
Tetanus	15 years (women)	2	1 month

Figure 1

A VACCINATION SESSIONS SCHEDULE shows the days and times at which vaccination sessions are to be held. It is important that mothers be informed of this schedule so they will know when to bring their children for vaccination.

Figure 2 on page 5 is a sample vaccination sessions schedule for a health centre. Figure 3 is a sample vaccination sessions schedule for the outreach activities of the same health centre.

\* There is no maximum time interval. Even if a year passes between successive doses of a vaccine, do not begin the series of multiple doses of DPT, polio, or tetanus vaccines again. Administer the next dose as if the minimum time interval has passed.



(Sample)

VACCINATION SESSIONS SCHEDULE			
<u>Village X</u> Health Centre			
Day	Morning	Afternoon	Evening or Night
Sunday			
Monday	Outreach	Outreach	
Tuesday			
Wednesday	VACCINATION		
Thursday			
Friday	VACCINATION		
Saturday			

Figure 2

(Sample)

VACCINATION SESSIONS SCHEDULE			
Outreach Activities for <u>Village X</u> Health Centre			
Village or Vaccination Site	Day	Time	Person Responsible
A	FIRST MONDAY OF EACH MONTH	MORNING	
B	SECOND MONDAY OF EACH MONTH	AFTER-NOON	
C	THIRD MONDAY OF EACH MONTH	MORNING	
D	FOURTH MONDAY OF EACH MONTH	MORNING	

Figure 3



Ideally vaccination sessions should be scheduled so that all children in the area served by the health centre or vaccination site can receive their first set of vaccinations as soon as possible after reaching the acceptable age. The children also need to receive their second and third doses of DPT and polio vaccines as soon as possible after the minimum one-month interval has passed. In order to ensure that all children in an area are vaccinated at the earliest acceptable age, vaccination sessions for each health centre or vaccination site should be held either daily or at regularly-scheduled days and times.

The number of vaccination sessions to be scheduled depends upon the number of children to be vaccinated in the area served by the health centre or vaccination site. If there are ten or more children to be vaccinated each day, schedule daily sessions. This will ensure that all children can be vaccinated at the earliest acceptable age, and will therefore give them the best protection against disease. If there are fewer than ten children to be vaccinated each day, the vaccines and the time of the health staff may be wasted by holding daily sessions, so it may be better to plan fewer vaccination sessions. The following steps will help you determine what your vaccinations schedule should be.

Your target population consists of the very young children in your area, usually those less than one year old. In most areas, these children make up three to four percent (3% to 4%) of the total population. The calculations in this module are based on the assumption that the number of children to receive vaccinations is 3% of the total population.

- 1.1 Determine the number of children per month to receive vaccinations in the area served by the health centre or vaccination site.



- 1.1.1 To determine the number of children to receive vaccinations for the year (annual target population), multiply the total population of the area served by the health centre or vaccination site by 3% (0.03).

Total Population	X	0.03	=	Number of Children to Receive Vacci- nations for the Year
---------------------	---	------	---	---

_____		Total population of area served by health centre or vaccination site
X	0.03	(Percentage of population to receive vaccinations)
=	_____	Number of children to receive vaccinations for the year

For example, if the total population of the area served by a health centre or vaccination site is 10,000, then the number of children who will receive vaccinations in one year is  $10,000 \times 0.03 = 300$ .

- 1.1.2 To determine the average number of children to receive vaccinations per month (monthly target population), divide the number of children to receive vaccinations for the year by 12.

Number of Children to Receive Vaccinations for the Year	÷	12	=	Average Number of Children to Receive Vaccinations Per Month
---	---	----	---	---

_____		Number of children to receive vaccinations for the year (from section 1.1.1)
÷	12	
=	_____	Average number of children to receive vaccinations per month



For example, for the health centre mentioned in the previous step, the average number of children who will receive vaccinations each month is  $300 \div 12 = 25$ .

## 1.2 Determine how often to conduct vaccination sessions.

1.2.1 From the mother's point of view, daily vaccination sessions would be the most convenient. She could bring her child for vaccination any day that the health centre is open and not have to remember a schedule of days and times. She could also seek other services for the same child, other children, or herself during the same visit to the clinic. Daily vaccination sessions would also be best for the child, who could receive his vaccinations whenever appropriate, rather than having to wait until the next scheduled session.

However, in determining how often to have vaccination sessions, the needs of the health staff must also be considered. They may be able to accomplish more work if they can set aside special days and/or times to vaccinate children than they can if they have to repeatedly interrupt other activities whenever a mother brings a child in to be vaccinated.

A balance is needed between the convenience to the mother and the convenience to the health staff. The appropriate balance may be achieved by selecting a minimum number of children for which a vaccination session should be scheduled. In many health centres, ten children may be the appropriate number to achieve the balance of convenience, and vaccination sessions should be scheduled whenever ten or more children are expected to come. The minimum number of children recommended for a vaccination session will depend on the size of the population of the area. For example, if the population is small, you may decide that 5 children are enough for a vaccination session, but if the population is large, you may decide that 15 is the smallest number of children for which a vaccination session may be scheduled.



Discuss with the mothers and the health staff the minimum number of children for which a vaccination session should be scheduled. Once the number has been chosen, the following procedures can help you decide how often to have vaccination sessions in order to best serve your community.

- 1.2.2 Each visit to the health centre or vaccination site for vaccination is called a "contact." Three to five contacts are required for one child to receive the complete series of vaccinations, so the total number of contacts will be three to five times greater than the number of children in the target population. The calculations in this module are based on the assumption that the number of contacts is 4 times the number of children to receive vaccinations.

To determine the number of contacts per month, multiply the average number of children to receive vaccinations per month by 4.

<p>Average Number of Children to Receive Vaccinations Per Month</p>	X 4	=	Number of Contacts Per Month
---	-----	---	---------------------------------

_____	Average number of children to receive vaccinations per month (from section 1.1.2)
X     4	(Number of contacts per child)
= _____	Number of contacts per month



For example, if a health centre serves a total population of 10,000, then the number of children to receive vaccinations for the year is  $10,000 \times 0.03 = 300$ ; the average number of children to receive vaccinations per month is  $300 \div 12 = 25$ ; and the number of contacts per month is  $25 \times 4 = 100$ .

1.2.3 To determine the maximum number of vaccination sessions which will be necessary, divide the number of contacts per month by the minimum number of contacts recommended for a session. For the calculations in this module, the recommended minimum number of contacts is 10.

- To calculate the maximum number of vaccination sessions per month for a village or vaccination site, divide the number of contacts per month by 10.

Number of Contacts Per Month	$\div 10 =$	Calculated Maximum Num- ber of Vaccination Sessions Per Month
---------------------------------	-------------	---

_____	Number of contacts per month (from section 1.2.2)
$\div 10$	(Recommended minimum number of contacts for a session)
$=$ _____	Maximum number of vaccination sessions per month

This is the maximum number of vaccination sessions you would schedule if you were going to plan for the minimum number of contacts per session. For example, for the health centre mentioned in section 1.2.2, the calculated maximum number of vaccination sessions per month would be  $100 \div 10 = 10$ .



However, you need to make a regular vaccination sessions schedule, with the sessions always held on the same days and at the same times. For example, if you scheduled 10 vaccination sessions per month, you might have 2 sessions during 2 weeks, on Monday and Wednesday, and 3 sessions during the other 2 weeks, on Monday, Wednesday, and Friday. This schedule might confuse mothers. They might bring their children to be vaccinated on one of the Fridays when there is no session. To prevent such problems, you could schedule only 8 sessions per month. You could schedule 2 sessions per week, one every Tuesday afternoon and one every Friday morning. Your staff would easily be able to vaccinate 2 or 3 more children per session, and the mothers would not be confused about when the vaccination sessions would be held.

The following chart (Figure 4) is a guide to help you determine the number of vaccination sessions you should schedule:

Calculated Maximum Number of Vaccination Sessions per Month (from step 1.2.3)	Number of Vaccination Sessions to Schedule
More than 20	1 per day
12-19	3 per week
8-11	2 per week
4-7	1 per week
2-3	1 every 2 weeks
1	1 per month
Less than 1	1 every 2 months

Figure 4



- You may need to make an additional plan if you provide measles vaccine. This requires only one dose per child and is often supplied in vials containing 10 to 20 doses each. The number of children requiring measles vaccine per month is the number you have already calculated in section 1.1.2, "Average Number of Children to Receive Vaccinations per Month." A vial of measles vaccine which is opened should not be used on the following day. So, to reduce waste, plan to schedule measles immunizations only when you will have enough children to warrant opening a vial of vaccine. This might be five or more children when you are using either 10 or 20 dose vials. Sometimes your plans will not work out and you may decide to open a vial for only 1 or 2 children. This is fine as an exception, but your planning should prevent this from happening too often.
- After the vaccination sessions schedule has been established and the sessions have begun, it is very important to stick to the schedule. Remember the following medical and practical reasons for ensuring that vaccination sessions are conducted on a regular basis:

#### Medical Reasons

- Vaccinate children as close as possible to the ages recommended in the immunization schedule so they will get the full benefit from each injection. If a child receives the injections when he is too young, his body will not be able to fight the diseases as well as if he gets the



injections at the proper age. But if the child is not vaccinated as soon as he is old enough, he stands much greater risk of getting the disease. This is why it is so important to begin vaccinating children at the age recommended by the immunization schedule.

- Ensure that each child receives three doses of polio and DPT vaccines. These vaccines are not strong enough to protect a child if he receives only one dose, so make every effort to give him three doses.
- Do not administer the second or third doses of polio or DPT vaccine to a child until at least one month has passed since the child received the previous dose. If a child receives the second or third dose of these vaccines before a month has passed, his body will not have had enough time to get the full benefit of the previous dose. The child's body will not have built up as much resistance against the disease as it should have and, even after he receives all three doses, the child will not be as strong against the diseases as he should be and may still become ill. So let at least one month pass between each dose of polio and DPT vaccines.
- Administer only one dose of measles vaccine to each child. One dose provides sufficient protection, and any other doses will be wasted.



- Your programme may administer tetanus vaccinations to either a) all women of childbearing age, b) pregnant women, or c) all mothers who bring their children to the vaccination sessions. These tetanus vaccinations are very important because they will protect the woman and any baby she will have during the next three years. If the woman has never had a tetanus vaccination before, she must have two doses in order to be protected, with at least one month between the doses. If the woman is pregnant, in order for the vaccine to be effective for the baby, she should receive the second shot no later than two weeks before delivery is expected. If the woman has had either a) one tetanus shot any time in the past, or b) a series of two or more tetanus shots which was completed longer than three years ago, she should receive one shot of tetanus vaccine.

#### Practical Reasons

- Follow the vaccination sessions schedule as closely as possible so that the children's vaccinations will be completed as early as recommended and at the least possible cost. If a mother brings her child in to be vaccinated on a day when a session is not scheduled, you may not be able to vaccinate him. If your programme is designed only to vaccinate at scheduled sessions, you may have vaccine only in multi-dose vials. Once opened, the vaccine must be used or it will become weak. If the vaccine is wasted, there may not be enough to vaccinate all the children who are brought to the scheduled sessions. So, in order to ensure



that the vaccine is not wasted, follow the vaccination sessions schedule.

- When scheduling vaccination sessions, consider both the importance of following the immunization schedule and your staff's time limitations. Do not set up a schedule which you may not be able to follow either because staff members have other duties to perform or because there will be too many children to vaccinate in the allotted time. If mothers bring their children to be vaccinated and are told that the session has been cancelled, or if mothers wait for a long time and are then told that there will not be enough time to vaccinate their children at this session and they must come on a different day, they will begin to lose confidence in the vaccination programme and will stop bringing their children to be immunized. It is essential that the vaccination sessions be held as scheduled and announced.
- It may not be possible to do advance publicity before each session. If a regular schedule is maintained, the mothers will know when the sessions are to be held, even if it is not possible to publicize each session.

### 1.3 Determine the vaccination sessions schedule for a health centre.

- #### 1.3.1 Consult local leaders for advice on the best days and times to conduct the vaccination sessions. Explain to the leaders that the schedule will be used for a long time, possibly years, and that therefore it is important to select days and times which can be used for as long as the vaccination activities continue, such as every Monday and Thursday morning.

### 1.3.2 Remember the following points:

- Avoid inconvenient days. Local market days or festival days, for example, may or may not be convenient. In some places, a market day or festival day will be a good time to hold a vaccination session because most people will come into the village and they will have free time. In other places, mothers may be so busy on market day that they have no time to bring their children to be vaccinated.
- Arrange the time of the sessions for the convenience of the mothers. Remember that times which are most convenient for you may not be most convenient for them. Avoid times when they are needed at home or have other duties.

### 1.4 Determine the vaccination sessions schedule for an outreach team.

Outreach vaccinators travel from a health centre to villages or vaccination sites which are not within easy walking distance of the centre, for example, more than 5 kilometres from the centre. Therefore, there may be transportation problems and cold-chain problems.

No matter what problems arise, however, it is essential that the vaccinators get to the village or vaccination site for the scheduled session. The vaccinators may often have to find alternative methods of transportation, such as riding a bicycle, using public transportation, borrowing a vehicle, or walking. The outreach vaccinators must be reliable and regular so that the children will be vaccinated according to the immunization schedule, and so that the mothers will not lose confidence in you and stop bringing their children to be vaccinated.

#### 1.4.1 In order to schedule vaccination sessions for areas or villages in which immunization sessions are to be held for the first time, perform the following tasks:

- Three to four months before sessions are tentatively scheduled to begin in an area, contact the local



government representatives and the traditional and religious leaders in the district or region in order to:

- explain the programme.
  - discuss with them the approximate date (e.g., month, week, etc.) that the immunization sessions will be held in their area.
  - request their cooperation.
  - arrange to meet with them in order to further discuss the immunization activities, schedule the vaccination sessions, and identify possible locations for the sessions.
- One month before sessions are tentatively scheduled to begin, meet with the government representatives and local leaders.
    - Try to arrange for the government, traditional, and religious leaders from all the villages in the district to attend the meeting.
    - If any villages are not represented at the meeting, visit the leaders of these villages individually.
    - Whether at the district meeting or the individual meetings, explain the following things to all the leaders in the district:
      - 1) the purpose of vaccinations.
      - 2) the kinds of vaccines to be given.
      - 3) who is to be vaccinated.
      - 4) the importance of complete participation by the public.
    - Try to get an accurate estimate of the population of each village.

- Determine, either at the meeting or while visiting the villages, which days and times each village prefers and why.
- Explain that the schedule will be used for a long time, possibly years, and that therefore it is important to select days and times which can be used for as long as the immunization activities continue, such as the morning of the third Friday of each month.
- Assure the leaders and health workers of each village that every effort will be made to schedule the sessions on the days and times they prefer, but warn them that, due to limitations, it may be necessary to schedule the sessions at alternate times.
- Explain that it is usually not possible to conduct vaccination sessions in each village because of the amount of time required for travel. Therefore it will often be necessary to hold sessions for two or more villages at a common gathering point or vaccination site, if an acceptable site can be found within walking distance of the villages.
- If leaders from all the villages are present, try to determine the precise vaccination sessions schedule at this meeting. If all the leaders are not present, however, or if you cannot decide on the schedule for some other reasons, explain that the schedule will be determined at the health centre, and that the leaders will be notified later of the days, times, and locations at which the sessions will be held.



- Determine the vaccination sessions schedule. Choose specific days and times for the sessions. Ensure that enough sessions are scheduled for each village or vaccination site so that all the children in the target age group can be vaccinated. (See section 1.2.3 on page 10.)

As you determine the specific days and times, remember to do the following:

- Schedule monthly sessions in villages where there will be at least ten children to receive vaccinations each month.
- If there are two or more villages located closely together with fewer than ten children to receive vaccinations each month in each of the villages, try to find a gathering point within easy walking distance of all these villages to use as a common vaccination site.
- Even if there will be fewer than ten children in a village or group of villages for a period of two months, schedule vaccination sessions for those villages or vaccination sites no longer than two months apart. The children in those villages must be vaccinated even if vaccine is wasted.
- Estimate the amount of time it will take to prepare the vaccination equipment and the vaccination site.
- Estimate the amount of travel time from the health centre to the vaccination sites and between vaccination sites. Allow some extra time in case of transportation problems.
- Avoid scheduling more than one session per day unless the sessions will be small and located fairly close together.

- Try to arrange the schedule so that the vaccinators can stay overnight in the first village where they will be vaccinating the following morning so they can 1) establish rapport with the villagers, and 2) be ready to vaccinate the children before the mothers start their day's work.
  - Avoid inconvenient days. Local market day or a festival day, for example, may be convenient in some places and inconvenient in others.
  - Arrange the time of the sessions for the convenience of the mothers. Remember that times which are most convenient for you may not be most convenient for them.
  - If possible, set aside some extra days to reschedule sessions which may have to be cancelled due to an emergency.
- As you determine the specific days and times for the vaccination sessions in each village, fill in the vaccination sessions schedule forms.

For example, if the total population of village L, the village in which your health centre is located, is 9,000, then the number of children to receive vaccinations for the year is  $9,000 \times 0.03 = 270$ ; the average number of children to receive vaccinations per month is  $270 \div 12 = 22.5$ ; the number of contacts per month is  $22.5 \times 4 = 90$ ; and the maximum number of vaccination sessions per month is 9. In order to have a regular vaccination sessions schedule for your health centre, you would have 2 sessions per week.

To determine when to conduct the sessions, you talk with some of the mothers in the village and to the health centre staff. You find out that the mothers are



all in the village for the market on Wednesday and Saturday each week. Although they are too busy during the morning, they usually have the afternoons free, so you decide to schedule the vaccination sessions for every Wednesday and Saturday afternoon. You then fill in the appropriate spaces on the vaccination sessions schedule form. (See Figure 5, on page 23.)

In order to make the vaccination sessions schedule for outreach activities, determine the number of sessions for each village or vaccination site just as you did for your village. Then determine the days and times for the outreach sessions in the same way that you chose them for the sessions at the health centre. Write the days, times, and locations of the outreach sessions in the appropriate spaces on the vaccination sessions schedule for outreach activities. (See Figure 6 on page 23.)

- Send a copy of the vaccination sessions schedule to the Regional Supervisor of Immunization Activities.
- Visit the village leaders again in order to tell them the days and times at which their immunization sessions are scheduled.

1.4.2 After the vaccination sessions schedule has been determined and the sessions have begun, scheduling becomes a simple process. The sessions will always be held at the same locations, on the regularly-scheduled days and times.

- When each vaccination session is held, tell the community leaders the exact date and time at which the next session will be held.
- Approximately one week before each vaccination session is scheduled to be held, visit the village or villages

(if the session is to be held at a common vaccination site) in order to:

- announce the date, time, and location of the session.
  - ask the community leaders to encourage the people to attend the vaccination session.
  - distribute posters, pamphlets, notices, etc.
  - make arrangements for accommodations if the vaccinators will be in the village overnight.
- Remember, if an emergency arises, the vaccinators must still make every possible effort to get the village or vaccination site for the session. If, however, it is absolutely impossible to get to the session, someone must go to inform the leaders and the mothers why you cannot be there, apologize to them, and schedule the session for another time.

VACCINATION SESSIONS SCHEDULE			
<u>VILLAGE L</u> Health Centre			
Day	Morning	Afternoon	Evening or Night
Sunday			
Monday	OUTREACH		
Tuesday			
Wednesday		VACCINATION	
Thursday			
Friday	OUTREACH		
Saturday		VACCINATION	

Figure 5



VACCINATION SESSIONS SCHEDULE			
Outreach Activities for <u>VILLAGE L</u> Health Centre			
Village or Vaccination Site	Day	Time	Person Responsible
M	FIRST AND THIRD MONDAY EACH MONTH	MORNING	
N	FIRST FRIDAY EACH MONTH	MORNING	
O	SECOND FRIDAY EACH MONTH	MORNING	
P	SECOND AND FOURTH MONDAY EACH MONTH	MORNING	

Figure 6

### Exercise A

Instructions: Do steps 1 through 5. Check your answers with a course manager when you have completed step 5.

1. Determine the annual target population (number of children to receive vaccinations for the year) for each village on the map (Figure 7 on page 26). To do this, multiply the total population of each village by the percentage (expressed as a decimal) of the total population which is to receive vaccinations. For this exercise, assume that the number of children to receive vaccinations is 3% (0.03) of the total population. Use columns 1 and 2 of the worksheet provided on page 27 to do your work.
2. Determine the number of vaccination sessions to schedule for each of the villages on the map (Figure 7). Use columns 3 through 6 of the same worksheet you used for step 1.

To do this:

- a. Divide the annual target population of each village (from step 1) by 12 in order to find the monthly target population (number of children to receive vaccinations per month) (column 3).
- b. Multiply the monthly target population of each village (from step 2.a) by the number of contacts per child, which you can assume to be 4 (column 4).
- c. For each village, divide the total number of contacts per month (from step 2.b) by 10 (the minimum number of children recommended for a vaccination session). This will give you the maximum number of sessions per month (column 5).
- d. Refer to the chart (Figure 4) on page 11 to determine the number of vaccination sessions to schedule (column 6).

Following is an example of how steps 1 and 2 should be performed.

The total population of a village is 3,000

Annual target population =  $3,000 \times 0.03 = 90$

Monthly target population =  $90 \div 12 = 7.5$

Number of contacts per month =  $7.5 \times 4 = 30$



Maximum number of sessions per month =  $30 \div 10 = 3$

Number of vaccination sessions to schedule = 1 every 2 weeks

3. Use your answers from steps 1 and 2 above to schedule vaccination sessions for each of the villages on the map. Be sure you schedule the appropriate number of sessions for each village. Assume that you have enough staff members to conduct as many vaccination sessions as you need to. Also assume that you have talked to mothers in each village in order to determine which days and times would be most convenient for them to attend vaccination sessions, and that you learned the following:

Village A - Mothers prefer different days, but most can come during the morning.

Village B - The market is held on Wednesday and Saturday mornings. Mothers are too busy to come during the morning, but they can come in the afternoon.

Villages C, D, and G - Mothers have time to come to the vaccination sessions during the Saturday morning markets.

Villages E and F - Markets are held on Wednesdays and Saturdays, but the mothers are too busy all day long to attend vaccination sessions on those days.

As you determine the specific days and times for the vaccination sessions for each village, fill in the spaces on the blank vaccination sessions schedule forms (Figures 8 and 9) provided on page 28. For this exercise do not write in the column labelled "Person Responsible," even though you will fill in this column when making vaccination sessions schedules for your health centre.

4. List at least ten possible obstacles which could prevent vaccination sessions from being conducted as scheduled. Use the worksheet provided on page 29 to do your work.
5. Describe the precautions you can take in order to prevent the problems which might arise from three of these obstacles. Use the worksheet provided on page 29.

10 kilometers

all-weather roads

bus routes

Total Population

Village A: 26,000

Village B: 5,000

Village C: 1,000

Village D: 2,000

Village E: 9,000

Village F: 7,500

Village G: 500

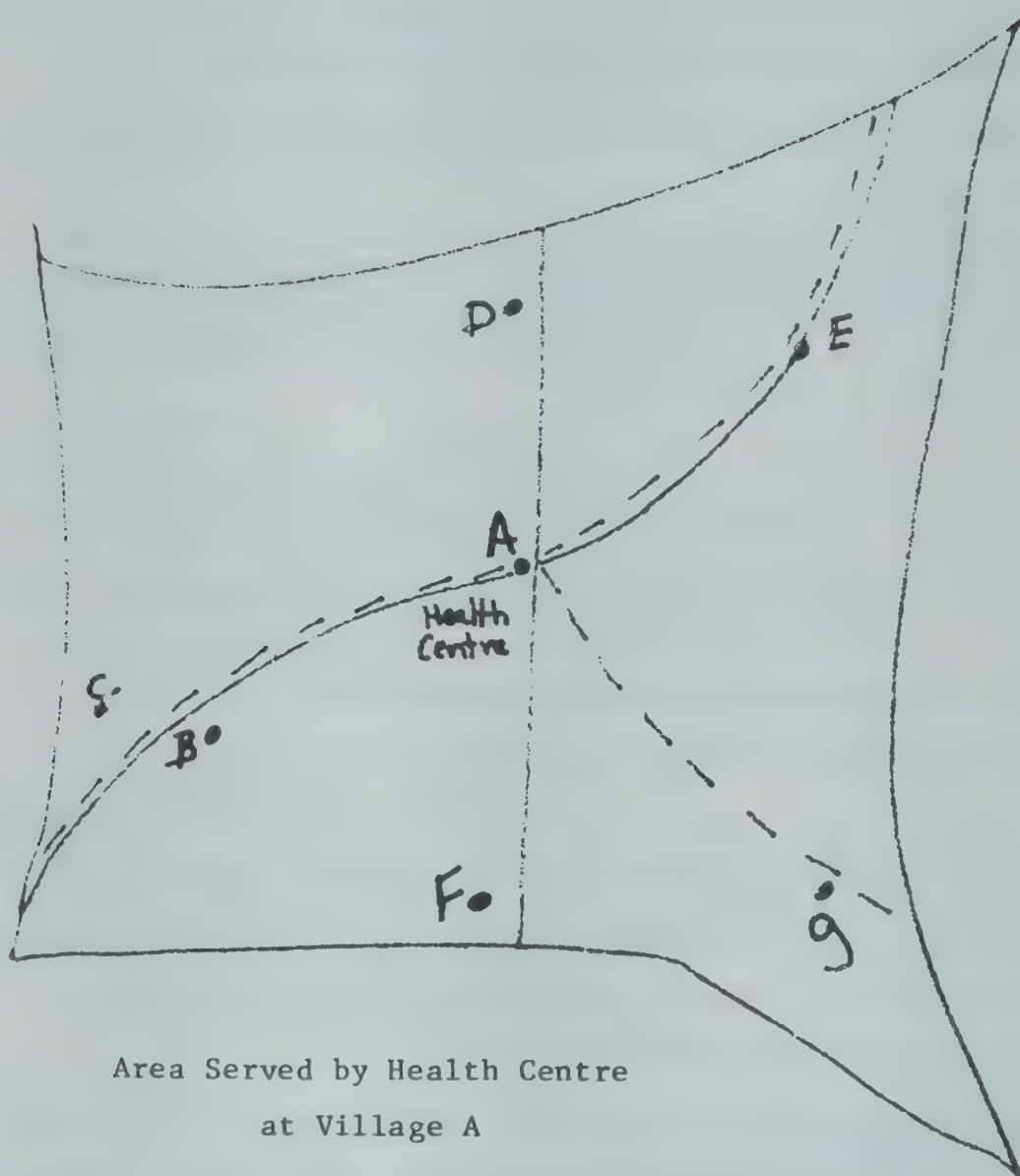


Figure 7



Worksheet for Exercise A, steps 1 and 2

	1	2	3	4	5	6
Village	Population	x 0.03	÷ 12	x 4	÷ 10	Number of Sessions to Schedule
Example: X	3,000	90	7.5	30	3	1 every 2 weeks
A						
B						
C						
D						
E						
F						
G						

Worksheet for Exercise A, step 3

VACCINATION SESSIONS SCHEDULE			
_____ Health Centre			
Day	Morning	Afternoon	Evening or Night
Sunday			
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Saturday			

Figure 8

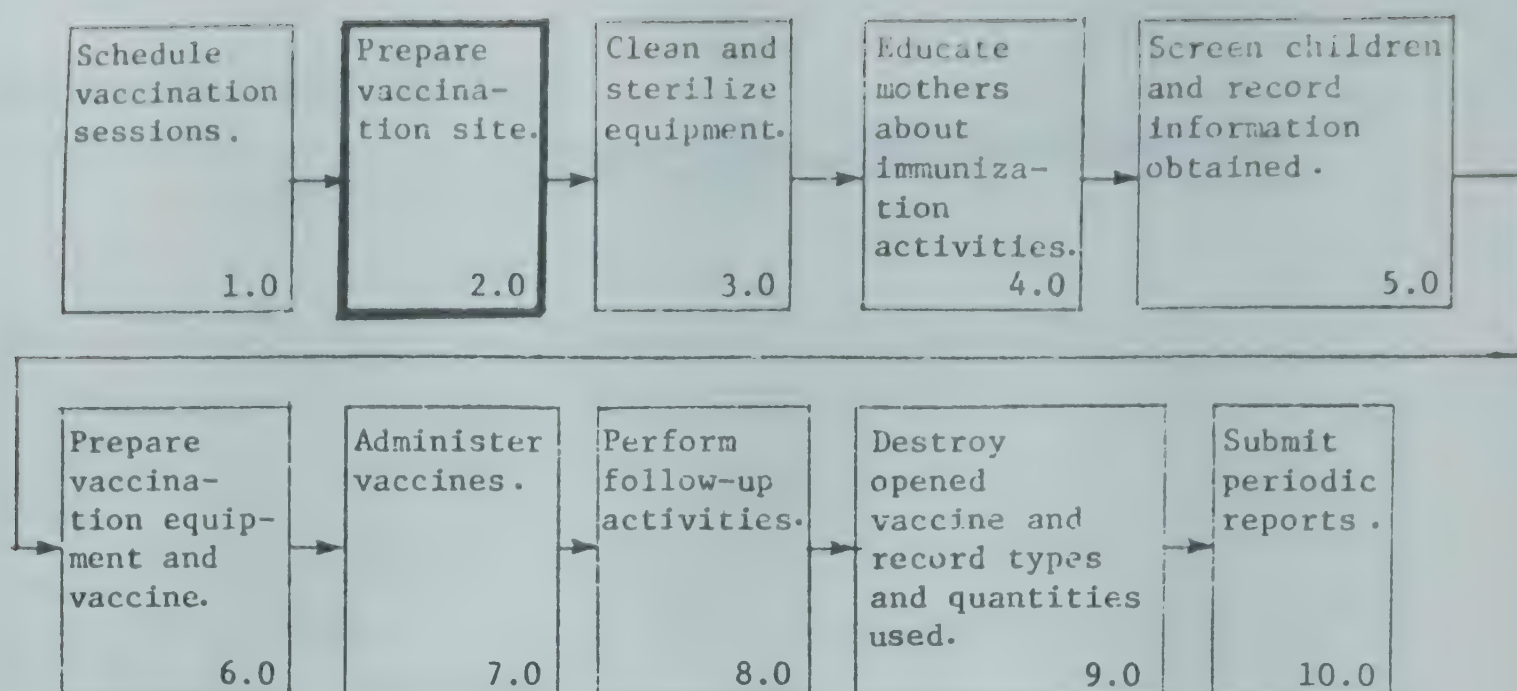
VACCINATION SESSIONS SCHEDULE			
Outreach Activities for _____ Health Centre			
Village or Vaccination Site	Day	Time	Person Responsible

Figure 9



Worksheet for Exercise A, steps 4 and 5

See a course manager when you have completed this exercise.



## 2.0 PREPARE VACCINATION SITE.

### 2.1 Select a suitable site for the session.

- 2.1.1 If the vaccination session is held inside the health centre or another building, choose a space that is large enough for the number of vaccination stations, vaccinators, mothers, and children expected to be in the vaccination area at one time. Use a single large room, smaller connecting rooms, a room and a hallway, or any suitable available area.
- 2.1.2 Vaccination sessions should preferably be held inside a building; however, if there is not a suitable building in which to conduct the session, hold it outside in a shady spot next to a building, or in an area which has trees for shade.

### 2.2 Organize vaccination stations.

- 2.2.1 Arrange the stations in a manner that is least confusing to the mothers and ensures smooth movement of people through the vaccination area. The number of stations which will be set up will depend largely on the number of persons expected to attend the session. If a large number of children is expected, it may be necessary



to set up a separate table for each vaccine as well as a screening station and an exit station. If a small number of children is expected, you may have as few as three tables: one for screening, one for vaccination, and one for exit activities. If small tables are not available but one long table is, several stations may be set up at the long table. Using the best available site and equipment, set up the vaccination site in the best way possible to serve the number of people expected.

For example, described below is a possible arrangement of stations in a session for 50 persons or more, including the duties to be performed at each station:

#### FIRST STATION:

- Issue vaccination cards and fill in biographical information.
- Screen mothers and children to determine which vaccinations to administer.
- Indicate on cards which vaccinations to administer.
- Direct those eligible for vaccination to second station.
- Direct those not eligible for vaccination to exit.
- Record vaccinations on Daily Vaccination Reporting Form and/or on the Vaccination Register.

#### SECOND STATION:

- Administer most frequently given vaccination. If both Polio and DPT vaccines are being given, Polio should be given first, otherwise the child may cry after receiving the DPT injection and resist any further attention.
- Direct those eligible for further vaccination to third station.

- Direct those not eligible for further vaccination to exit.

#### THIRD, FOURTH, FIFTH, etc. STATIONS:

- Administer less frequently given vaccinations, using a separate station for each vaccine.
- When mother and child complete all vaccinations for which they are eligible, direct them to the exit station.

#### EXIT STATION

- Ensure that the mothers know when to bring their children back for further vaccinations by asking them the date they should return.
- Explain possible reactions to the vaccines and what to do if they occur.
- Direct mothers to proper place for other treatment.

#### 2.2.2 In order to organize a vaccination session in a building, perform the following tasks:

- Select one entrance and one exit to the vaccination area. Close and lock any additional doors.
- Ensure that there is a place for the mothers to sit and wait comfortably. If the waiting area is outside, it should have a roof for protection against sun and rain.
- Guide the mothers into a single line to enter the room where the vaccinations are being given.
- Limit the number of mothers in the room to a reasonable number (one at each station) by admitting a new mother into the room only when another mother has left.



2.2.3 In order to organize a vaccination session in the open, perform the following tasks:

- Enclose the vaccination area to prevent people from entering or leaving except by the designated entrance and exit.
- Guide the mothers into a single line to enter the vaccination area.
- Limit the number of mothers in the area at one time to a reasonable number (one at each station) by admitting a new mother into the area only when another mother has left.
- Place the tables for vaccinations in the shade. If vaccine is kept in the sun, it loses its effectiveness in a short period of time.

See Figure 10 for one way to organize a vaccination session, whether in a building or in the open.

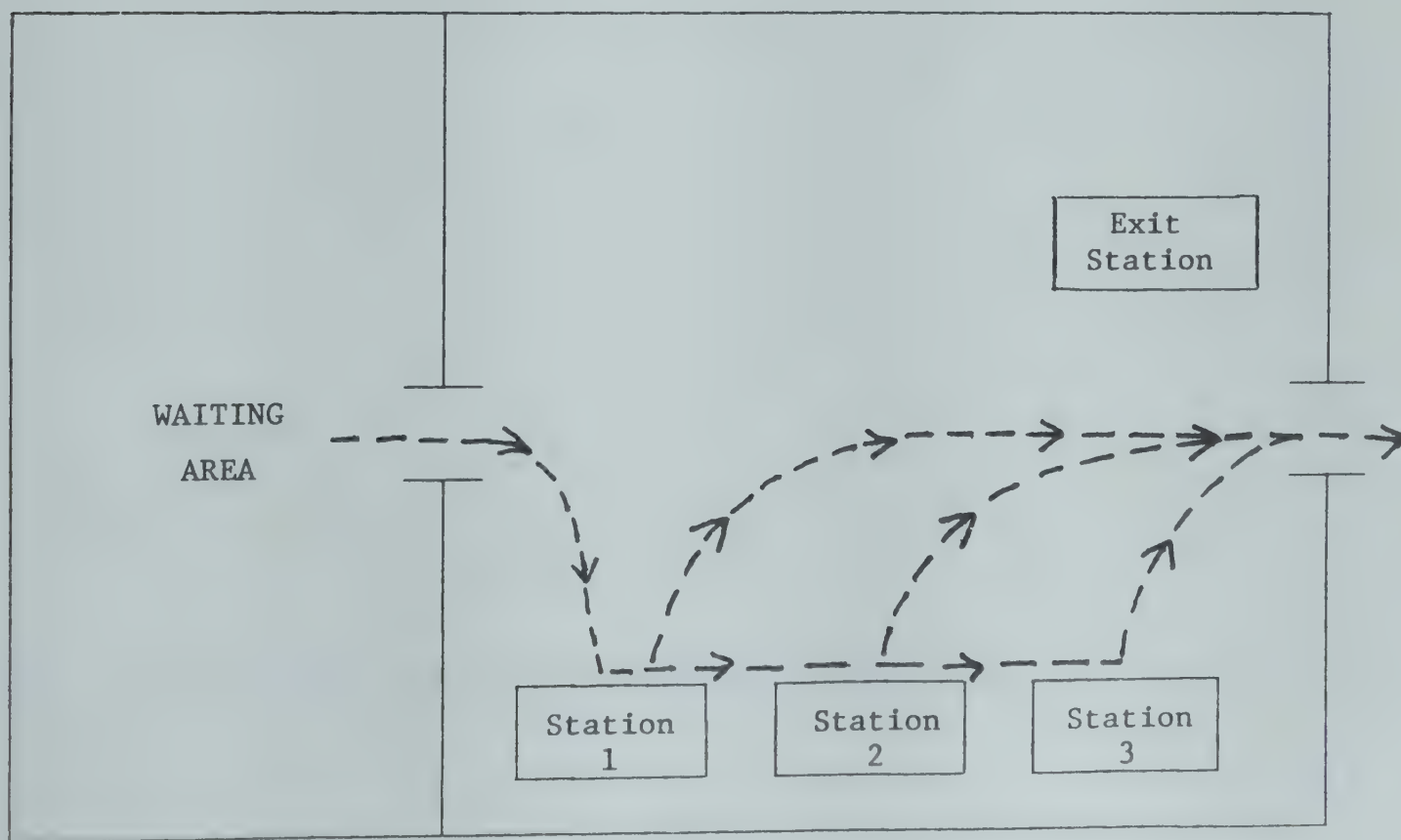


Figure 10

## Exercise B

Instructions: Do steps 1 and 2 below, using the worksheet on page 35. See a course manager when you have completed step 2.

1. Draw a diagram of your health centre or vaccination site, indicating the way vaccination stations have been organized for sessions in the past. If you have not conducted a vaccination session at your health centre before, indicate the way stations might be organized for a vaccination session.
2.
  - a. Describe some problems which could arise in organizing vaccination sessions in your health centre or vaccination site.
  - b. Describe the improvements which could be made to your health centre or vaccination site in order to facilitate organizing vaccination sessions.



Worksheet for Exercise B

1.

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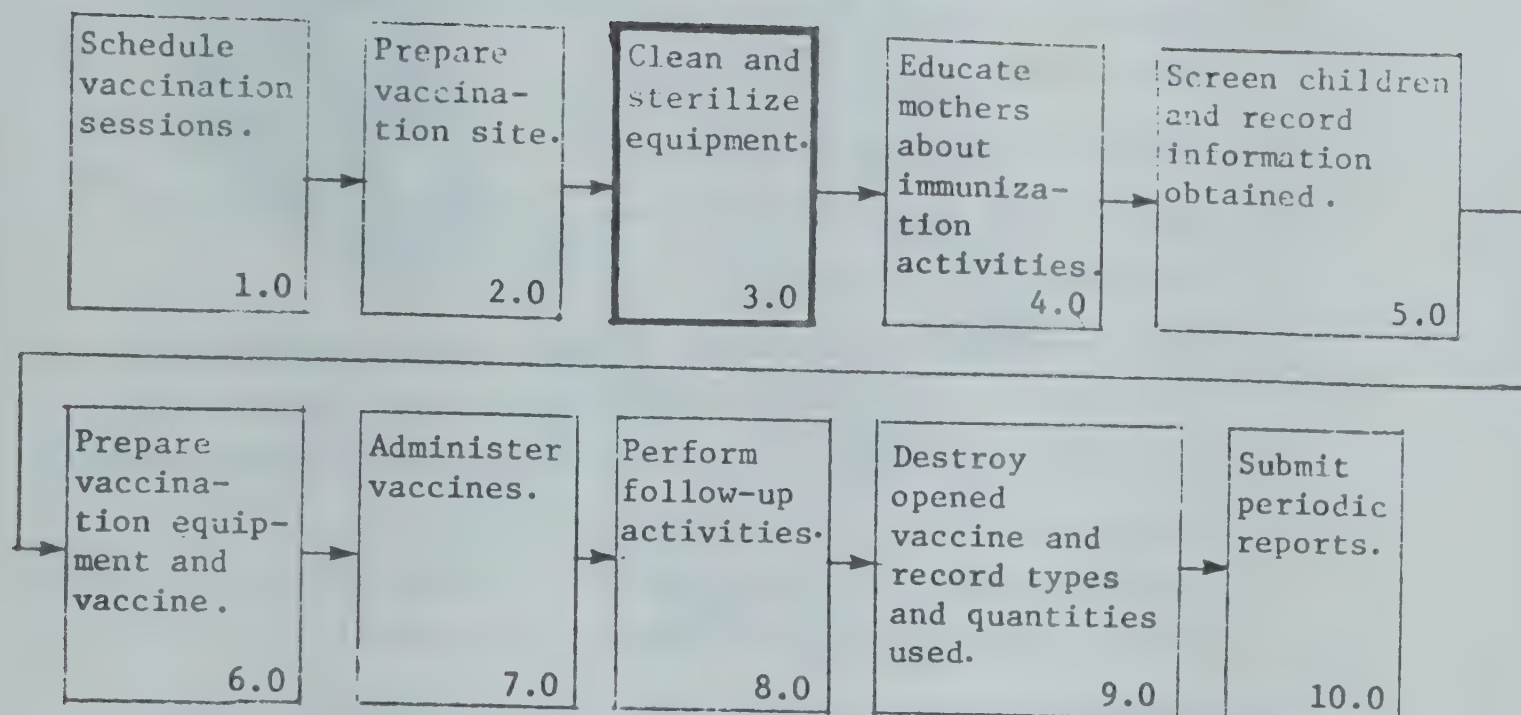
2.

See a course manager after you have completed this exercise.

### Exercise C

Instructions: This will be a practical exercise in preparing a vaccination site.. Your course manager will give you instructions on what to do.





### 3.0 CLEAN AND STERILIZE EQUIPMENT.

Use disposable needles and syringes if they are available. If disposable needles and syringes are used:

- vaccinate only one child with each needle and syringe, and
- save the needles and syringes during the session so you can count them and dispose of them properly later.

If disposable needles and syringes are not available, it is essential that vaccination equipment be cleaned and sterilized properly.

If vaccinations are performed on a daily basis, clean and sterilize the equipment at the end of the vaccination sessions each day so that you will be ready to begin the sessions the next day without having to take time to clean and sterilize. If vaccination sessions are held at weekly or monthly intervals, clean the equipment at the end of the sessions, and sterilize it on the night before or the morning of the day of the session.

an the syringes and needles and prepare them for sterilization.

- 3.1.1 Rinse all the syringes and needles in clean water. Do not use detergent since it is hard to rinse out, and if any is left in the syringe it may weaken the vaccine.
- 3.1.2 Take the plungers out of the barrels of the syringes.
- 3.1.3 Use a clean piece of cotton wool or gauze to remove any dirt, etc. in the barrels of the syringes.
- 3.1.4 Wrap the barrel and plunger of each syringe together in one piece of gauze, but keep the barrel and plunger from touching one another by rolling a layer of the gauze between them. Keep the barrel and plunger wrapped by pushing a needle through the roll of gauze or tying a piece of string around the middle. (See Figure 11 on page 39.)
- 3.1.5 Push the needles through small rolls of gauze to protect their points. (See Figure 11 on page 39.)

### 3.2 Sterilize equipment.

- 3.2.1 Put all the syringes, needles, forceps, etc. into the tray of the sterilizer or into a saucepan or pressure cooker. (See Figure 12 on page 39.)
- 3.2.2 Put the tray into the sterilizer.
- 3.2.3 Pour in enough water so that everything is covered by at least two centimetres of water.
- 3.2.4 Put on the lid.
- 3.2.5 Light the burner(s) and bring the water to a boil.
- 3.2.6 If you are using a sterilizer or saucepan, boil the water for 20 minutes. If you are using a pressure cooker, heat to a pressure of 15 pounds for 15 minutes. Ensure that the water boils continuously. If the water temperature falls below boiling, any equipment cleaned in this water will not be sterile.
- 3.2.7 Turn out the burner(s).



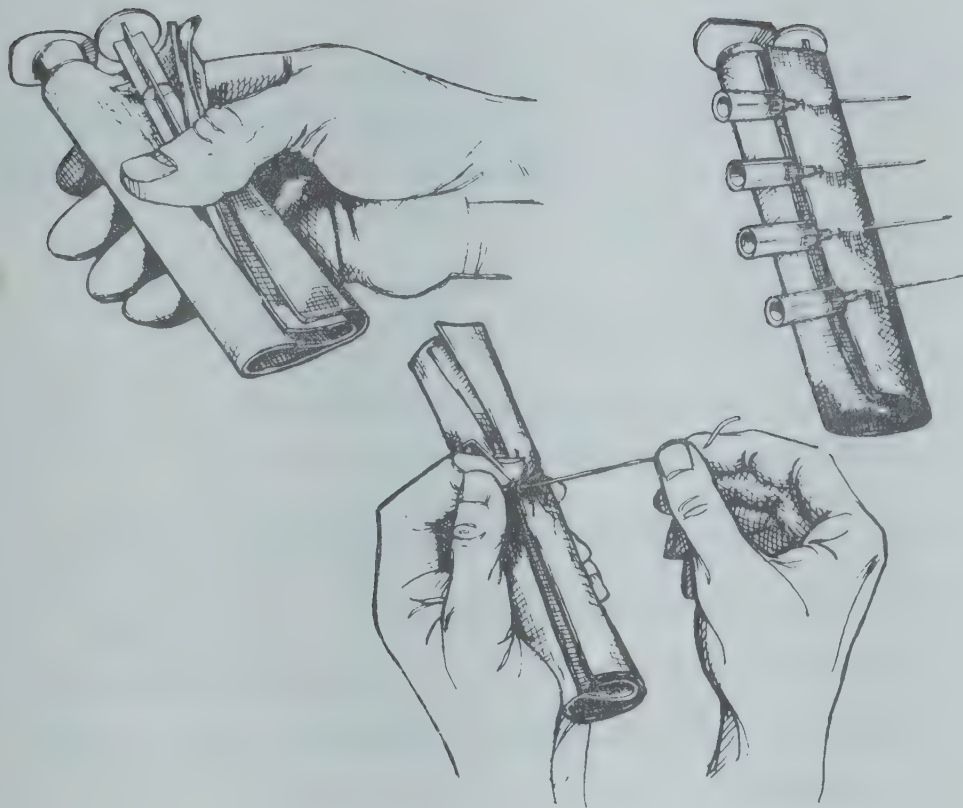


Figure 11

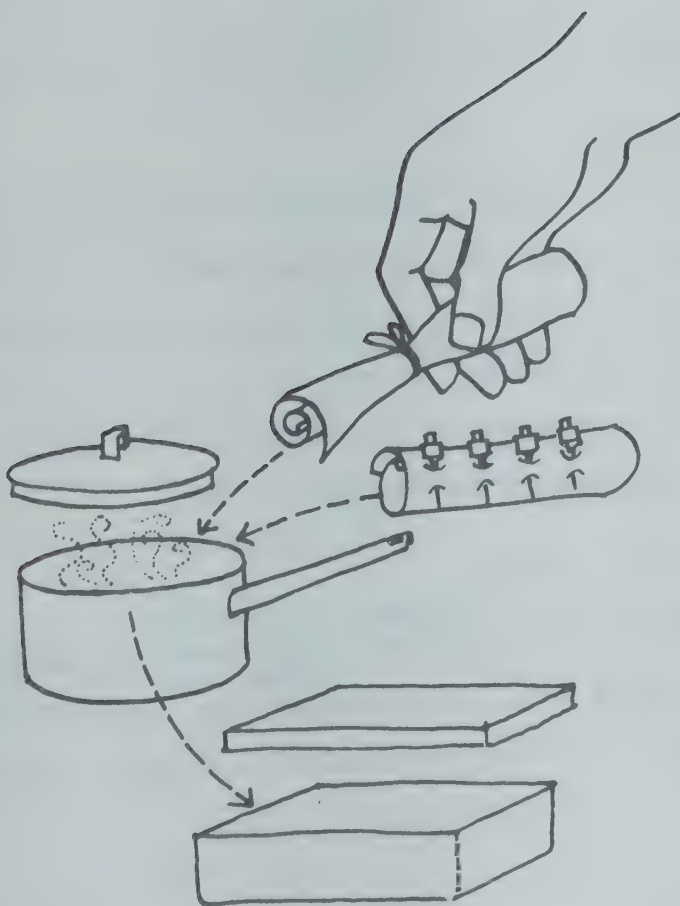


Figure 12

3.2.8 If you are using a sterilizer:

- Carefully lift out the tray of the sterilizer and put it down on the upturned lid of the sterilizer.
- Pour away the water.
- Replace the tray and put the lid back on.
- Leave the sterilizer and its contents to cool until they are needed.

3.2.9 If you are using a saucepan or pressure cooker:

- Lift out the cloths containing syringes and needles and place them in a tin which has been previously sterilized by boiling. Put the lid on the tin.
- Leave the syringes and needles to cool until they are needed.

3.2.10 Do not touch any of the sterilized equipment. If anything falls out of the sterilizer or pan or is touched with the hands, it is no longer sterile, and it must be sterilized again.

Ideally, there would be enough needles and syringes to vaccinate each child with a clean, sterile one, in which case it would not be necessary to clean and sterilize during the session. In reality, however, there usually are not enough syringes and needles, so it will be necessary to clean and sterilize during the session, using the methods described above,

3.3 Sterilize BCG needle by flaming.

In giving BCG vaccinations, the same needle and syringe may be used to vaccinate several children if properly sterilized. If you cannot sterilize by boiling, you must sterilize the needle by flaming it after each injection.

In order to sterilize by flaming, leave the needle in the syringe and perform the following steps:

- If there is vaccine remaining in the syringe:
  - Put the point of the needle in the top of the flame of the spirit lamp and hold the tip of the needle over the flame till it starts getting red. This will take about two seconds. Do not let the entire needle become red hot, just the very tip.
  - Allow the needle to cool for about five seconds.
  - Keeping the needle pointed down and away from you so none of the vaccine will get on you, expel a few drops of vaccine to be sure the needle is not obstructed.
  - You are now ready to vaccinate again.
- If the syringe has been emptied by the last injection:
  - Flame the entire needle, up to the hub.
  - Let the needle cool to room temperature.
  - Refill the syringe.

### 3.4 Maintain the BCG syringe.

3.4.1 Clean the kit well after each vaccination session.

3.4.2 Sterilize the kit before each session.

3.4.3 Stainless steel needles can each be used for a few hundred injections, but the points do become dull after a while.

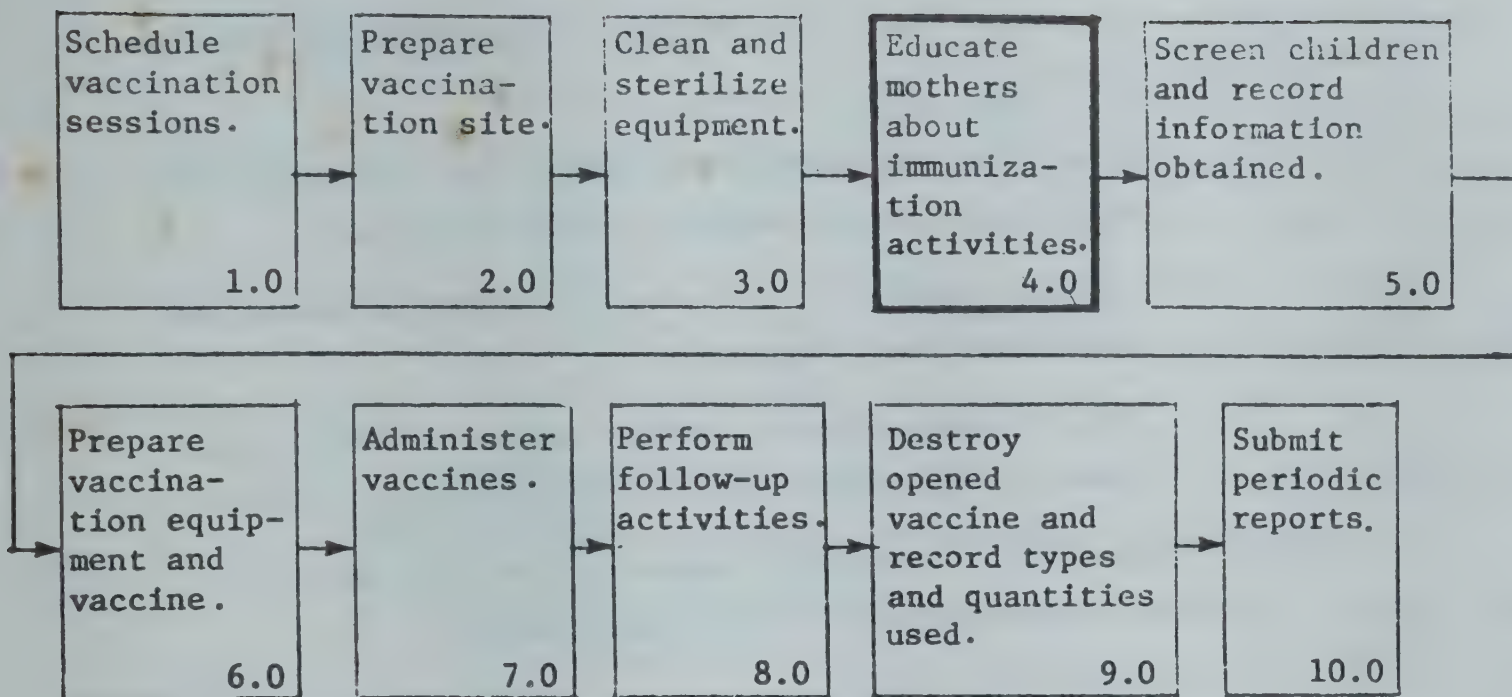
Check the needles and discard any that are blunt or corroded.



3.4.4 At the end of the metal plunger of the BCG syringe is a small red neoprene ring which sits in a groove. This ring may become split or worn and vaccine will then leak from the syringe. If this happens, replace the ring.

In order to change the ring, do the following:

- Remove the old ring with the point of a knife.
- Place a new ring on the end of the plunger and squeeze it into position in the groove with your thumbs. You may sparingly use some high vacuum silicone grease to improve functioning (but not petroleum or mineral oil).
- Sterilize the complete syringe before you use it again.



#### 4.0 EDUCATE MOTHERS ABOUT IMMUNIZATION ACTIVITIES.

It is important that the mothers understand why their children are being immunized, which diseases they are being immunized against, and why they have to bring their children back for more injections. Educating the mothers is especially important in outreach situations since health workers are in the village or at the vaccination site for only a short period of time. Between visits the mothers may have no source to consult if they become concerned about their children, so it is essential that they understand the facts about immunization.

Ideally, the education process will be conducted in three phases: in a group talk/discussion before vaccinating the children, at the vaccination stations, and at the exit station after the vaccinations.

##### 4.1 Explain immunization and the immunization activities in group talks/discussions before administering vaccinations.

A good time to educate mothers is before their children are vaccinated, while they are in the waiting area. If they have a comfortable, sheltered area where they can sit, mothers will not become impatient and they will be more likely to listen closely and participate in the discussion.

Five to ten mothers is a good size for group talks/discussions if there is enough time.

4.1.1 Keep a group talk/discussion short and practical and primarily a time for mothers to ask questions.

- Invite members of the group to supply answers, and encourage free discussion.
- Ask for suggestions from the mothers to help solve some of the problems with the vaccination sessions.

4.1.2 Ensure that the mothers understand and can describe the important facts about immunization.

- Stress the importance of the immunization activities to the mothers, their children, and the community. Explain the benefits but do not exaggerate them.
- Identify the age groups to be immunized and explain why others will not be immunized.
- Explain which diseases the children will be immunized against and why. Emphasize that children who are not vaccinated will not be protected and that there is little or no treatment available if they get these diseases. (See Annex 1 on page 82 for information on the diseases and vaccines.)
- Stress the need for return visits and the date and time at which to return.
- These mothers already have some information about immunization, or they would not have brought their children to be vaccinated. Use this time also to compliment them for coming, and encourage them to convince other mothers, particularly new mothers with their first baby, of the importance of having their children vaccinated.



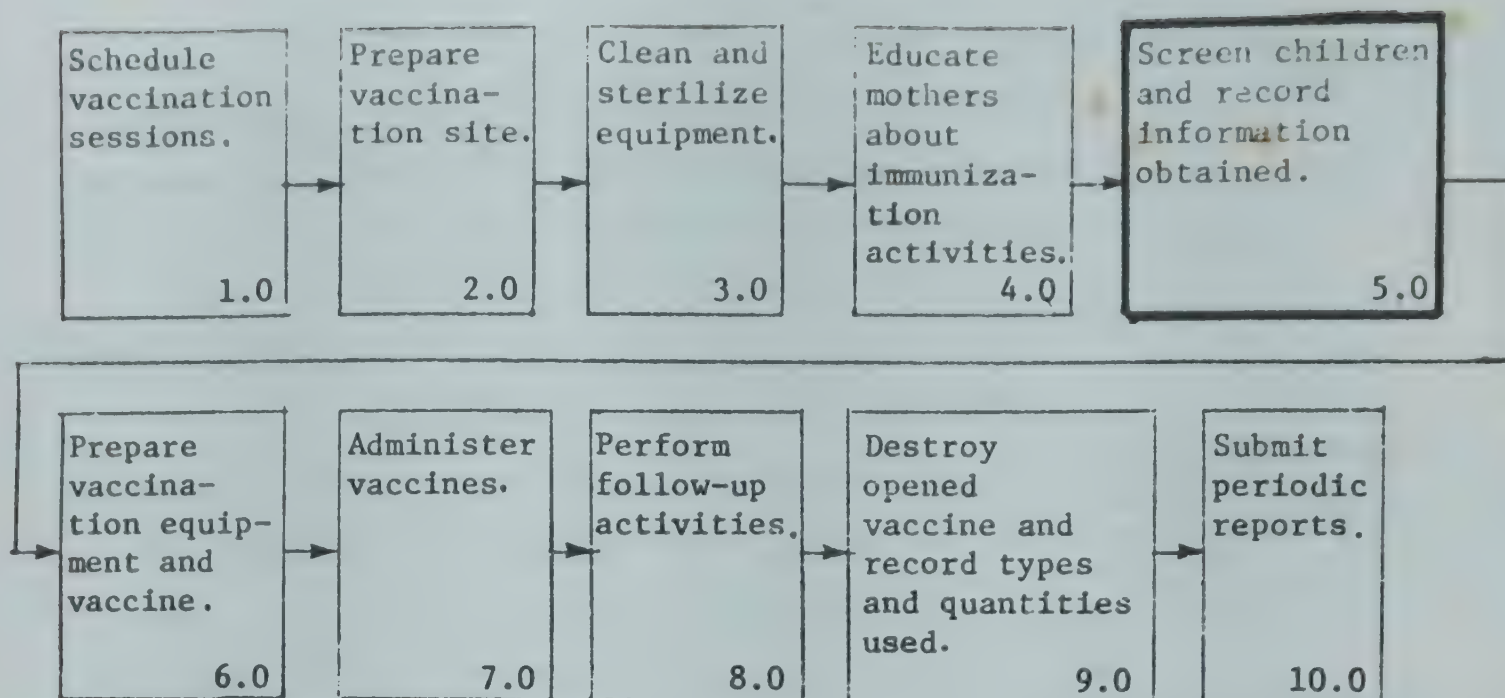
- Do not overdo a good thing, however. Educating and motivating the mothers who have come to the vaccination session is important, but do not make them wait for a long time just to listen to you. Prompt, courteous service will do more to encourage attendance than words will.

4.2 At the vaccination stations, ensure that the mothers understand the important facts about the diseases and the vaccines.

4.2.1 As you vaccinate each child, ask the mother if she has any questions. Explain anything she is uncertain about.

4.2.2 While administering DPT and Polio vaccines, explain that these vaccines are not strong enough to protect the child if he receives just one dose, so the mother must bring her child back to receive these vaccines two more times.

Education of mothers as they leave the vaccination session is discussed in Section 8.0.



#### 5.0 SCREEN CHILDREN (AND MOTHERS IF INCLUDED) AND RECORD INFORMATION OBTAINED.

- The purpose of screening is to determine not only a child's immunization status, but also his general state of health. Therefore, in the screening process you should determine at least the child's age and weight as well as which vaccinations he has received, if any, and which vaccinations he is to receive at this session.
- The information about the child must be recorded on a substantial, important-looking card and given to the mother. If the mother is given such a card, she will make an effort not to lose the card and to bring it with her when she brings her child back for further immunization.

Following are a few examples of the kinds of vaccination cards which can be used:

— Growth Chart (See Figure 13 on page 47.)

This chart contains a grid for plotting the child's weight by age as well as spaces to record biographical information, reasons for special care, information about the child's brothers and sisters, and the child's immunization status.

### A. Face of chart

110

## GROWTH CHART



The area between the curving lines on the grid indicates the normal weight range of a healthy child. If the child's weight is above the upper line or below the lower line, note on the card that the child needs nutritional follow-up.

- Vaccination Card. (See Figure 14.)

This card contains spaces for recording only the biographical information about the child and his immunization status.

VACCINATION CARD			
Name			
Name of Mother			
Name of Father			
Male or Female			
Birthdate	day	month	year
Name of village			
VACCINES	DATE GIVEN		
	day	month	year
BCG			
DPT I			
DPT II			
DPT III			
Polio I			
Polio II			
Polio III			
Measles			
Tetanus I			
Tetanus II			
Other			

Figure 14

- Family Vaccination Card. (See Figure 15 on page 49.)

This card contains spaces for recording the biographical and immunization information about all the children in a family.

FAMILY VACCINATION CARD												
Name of Father												
Name of Mother												
Name of Village												
VACCINES		BCG	DPT I	DPT II	DPT III	Polio I	Polio II	Polio III	Meas- sles	Teta- nus I	Teta- nus II	Other
Name of Child	Date of Birth											

Figure 15

- A record of vaccinations may also be kept by the vaccination staff. If the vaccinators keep a record of vaccinations, they can determine which vaccinations a child has received even if his mother loses the Growth Chart or Vaccination Card. Also, if attendance at the sessions is low, the vaccination staff can determine which mothers are not bringing their children to be immunized and contact them.

Following are several methods which can be used to keep records of vaccinations at the health centre:

- Family Card or Booklet.

The same information which is recorded on the child's Vaccination Card is recorded on a Family Card or, if there is a booklet, on one page of the booklet. This card or booklet is retained by the vaccinators.

- Register.

This is a book in which a running list is kept of the names of the children born, which ones are vaccinated, which vaccinations they received, and the dates on which they received them.

- Duplicate Vaccination Card.

This is an exact duplicate of the card which is given to the mother. The duplicate is filed either alphabetically or according to the date on which the child is due to receive his next set of vaccinations.

CAUTION: Records should be kept only if they will really be used. A general health card such as the Growth Chart or a vaccination card is the minimum that should be kept. Other records should be kept only if a) there is a plan for their use, b) the staff has enough time, and c) keeping them does not interfere with the provision of health care.



In order to screen the children and mothers and record the information obtained, perform the following steps:

- 5.1 If the mother does not have a vaccination card for the child, issue one.
  - 5.1.1 Fill in the child's name, the parents' names, and the village name or address.
  - 5.1.2 Establish the child's birthdate. If the mother does not know the child's birthdate, estimate it as accurately as possible to the month.
  - 5.1.3 If the child is too young to receive any vaccinations, explain this to the mother and tell her when the child will be old enough to be immunized.
- 5.2 If the mother does have a vaccination card for the child, review it to see that the information on it is complete and correct.
- 5.3 If the vaccination card which you use has a space for the child's weight and height, weigh and measure him and record the weight and height on the card.
- 5.4 Record on the card any diseases the child has had, or recommendations for nutritional follow-up.
- 5.5 Determine which vaccines to administer. (See Figure 1 on page 4 for a sample immunization schedule.)

Record in the proper spaces on the card which vaccinations the child is to receive at this session.

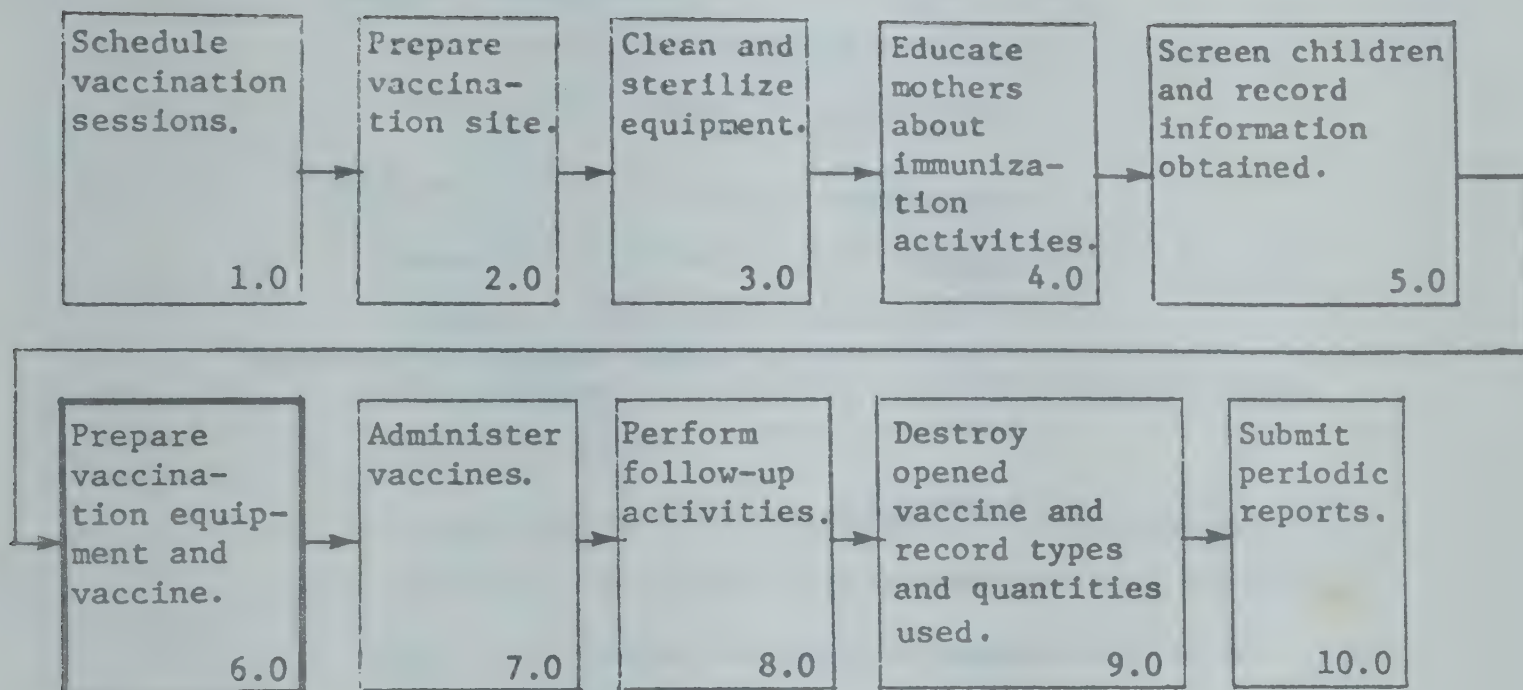
NOTE: Contraindications to vaccinations have in general been overemphasized, and many children who should have been immunized have not been. The only children who should not be immunized are those who are critically ill. Malnutrition should never be considered a contraindication. In fact, malnourished children are even more susceptible to serious disease and death than well-fed children, so it is especially important that they be vaccinated.

- 5.6 If there is a duplicate record system which is maintained at the health centre, enter on the family card or booklet, in the register, or on the duplicate vaccination card, the same information that you enter on the mother's copy of the card.
- 5.7 Give the vaccination card to the mother and emphasize that it is very important that she keep the card and bring it with her when she brings her child back for his next set of vaccinations.
- 5.8 In some countries a colour-coding system is used to help ensure that children receive all the vaccines they are supposed to receive. As the screener determines which vaccines a child should receive, he gives the mother a group of coloured cards or discs. Each colour represents a particular vaccine, for instance yellow for BCG, green for polio, blue for DPT, and red for measles.

The mothers are then instructed to go to each vaccination station which displays a sign with the same colour as one of the cards in her hand. Each vaccinator will take up the card or disc which represents his vaccine as he vaccinates the child.

When the mother reaches the exit station, the vaccination worker will check to see if she still has any cards or discs. If she does, then her child has not received all the vaccinations he was supposed to receive, and she is sent back to the appropriate vaccination station. If she does not have any cards or discs, then the child has received all the vaccinations he was supposed to receive, and the mother can leave.

At the end of the session, the cards at the vaccination stations can be counted in order to determine how many vaccinations of each type were given during the session.



## 6.0 PREPARE VACCINATION EQUIPMENT AND VACCINE.

### 6.1 Place the equipment in the proper locations.

#### 6.1.1 Place the equipment at the stations as follows:

- At the screening station:

- two chairs
- vaccination cards
- growth charts
- scale and measuring device
- duplicate record system materials
- tally sheets
- coloured cards or discs



- At each vaccination station:

- 2 chairs (one for the mother and one for the vaccinator)
- water, soap, towel
- methylated spirit
- gauze
- sterilizer, pressure cooker, or saucepan
- kerosene stove
- kerosene
- forceps
- ampoule files
- a cup

- At the polio station:

- usually, no special equipment is required
- vaccine: choose the size container (10, 20, 50, or 100 doses) which best meets your needs.

Keep vaccine on ice.

Never expose the vaccine to the sun

- At the DPT and tetanus stations:

- syringes<sup>\*</sup> : size 1 ml.
- needles<sup>\*</sup> : size 22 short gauge 30 mm 7/10 (G 22 - 1-1/4 inch)
- container for sterile needles and syringes
- container for dirty needles and syringes
- vaccine: choose the size container (10 or 20 doses) which best meets your needs.

<sup>\*</sup> If jet injectors are being used rather than needles and syringes, see Annex 2.

Keep vaccine cool during the session. (See step 6.5 on page 60 for details.)

- At the BCG station:
    - several sterilized 1 ml. BCG vaccination syringes (Omega - "microstat tuberculin")
    - one sterilized needle for each BCG syringe (10 mm, 25 or 26 gauge)
    - sterilized 10 ml. syringes for reconstituting the vaccine (one syringe for each ampoule of vaccine)
    - one long 18-gauge sterilized needle for each 10 ml. syringe
    - a spirit lamp with shield
    - a sterilized metal box with lid, containing a plate fitted with clips to hold the syringes and needles, or a sterile gauze to protect them
    - a piece of foil or paper to cover the opened ampoule
- Keep vaccine and diluent cool together, out of the light.

- At the measles station:
  - syringes: size 1 ml.
  - needles: size 22 short gauge 30 mm 7/10 (G 22 - 1½ inch)
  - container for sterile syringes and needles
  - container for dirty needles and syringes
  - vaccine and diluent to be kept cool together:  
choose the size container (1, 5, 10 or 50 doses) which best meets your needs.

Keep vaccine on ice.

Never expose the vaccine to the sun.

- At the exit station:

No equipment is really necessary at the exit station, but you may place a table and chair here so that the person at the station can sit down.

6.1.2 Position the refrigerator or cold box so that it is convenient for all the vaccinators and out of the way of the mothers and children.

6.2 Reconstitute\* freeze-dried BCG and Measles vaccine.

6.2.1 If the diluent or vaccine is in a glass ampoule, perform the following steps in order to open the ampoule:

- file entirely around the neck of the ampoule (See Figure 16 on page 57).
- if the ampoule contains powder, wrap a piece of plastic, cloth, or some other protective covering around the neck in order to avoid cutting your fingers or losing some of the powder.
- break the neck of the ampoule.

6.2.2 If the diluent or vaccine is in a rubber-capped container, remove the metal part over the rubber stopper.

6.2.3 Draw the correct amount of reconstituting fluid up into the syringe, according to the vaccine manufacturer's instructions.

- Do not prepare BCG vaccine with the Omega syringe which is used for administering the vaccine. Instead use a 10 ml. syringe and a long-mixing needle.
- Reconstitute measles vaccine only with cold diluent (+4° C to +8° C). Otherwise the vaccine will be killed very quickly.

\* Mix container of vaccine powder with a container of diluent.



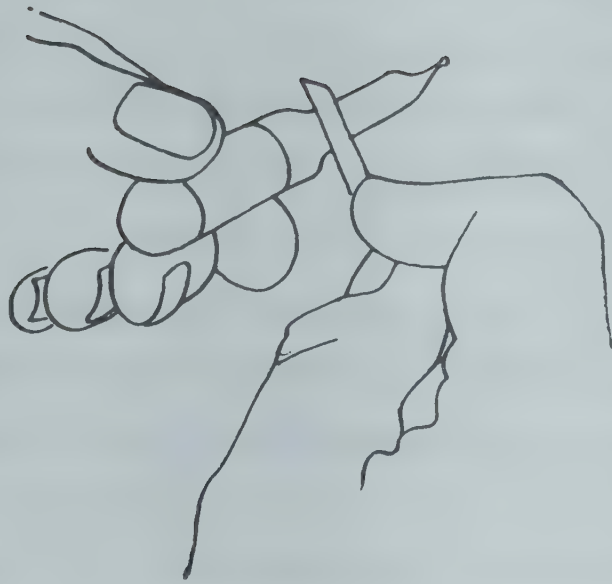


Figure 16

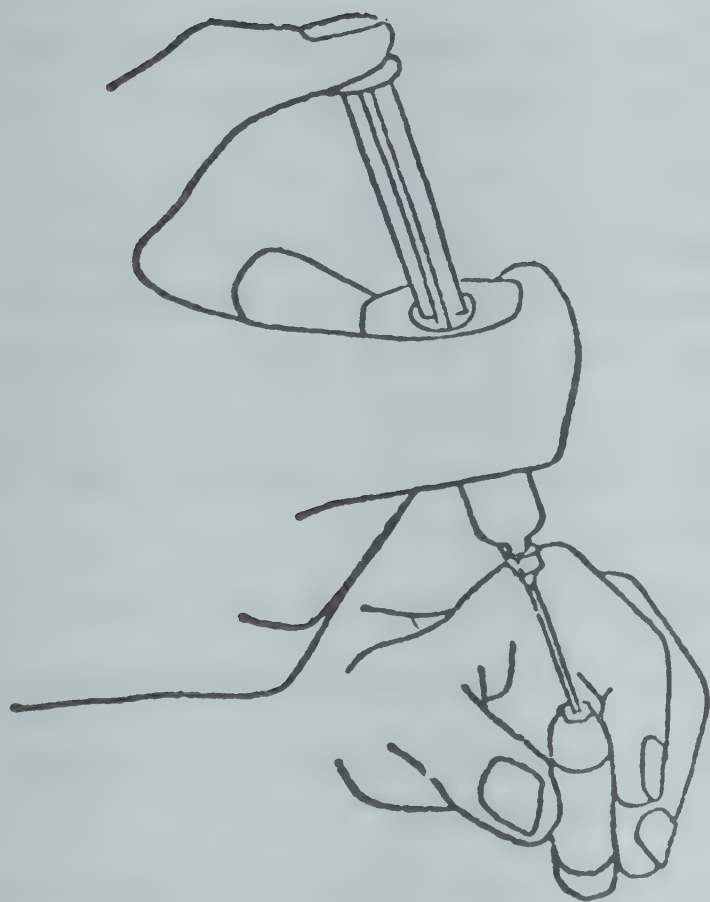


Figure 17

- 6.2.4 Empty the diluent from the syringe into the ampoule with the vaccine. (See Figure 17 on page 57.)
- 6.2.5 Thoroughly mix the diluent and vaccine by drawing the mixture back into the syringe and expelling it into the ampoule several times, but do not shake the ampoule.
- 6.3 Prepare needle and syringe for BCG injection.
- 6.3.1 Heat the hub of the needle and flame the tip of the barrel of the syringe. (See Figure 18 on page 59.)
- 6.3.2 Fit the BCG needle firmly to the Omega syringe and twist it so that the bevel of the needle tip faces the same way as the scale marked on the barrel of the syringe. (See Figure 19 on page 59.)
- 6.4 Load the syringe with vaccine.
- 6.4.1 Draw liquid or reconstituted vaccine into the syringe from the ampoule. (See Figure 20 on page 60.)
- For measles, DPT, and tetanus, draw out only the amount of vaccine needed for one injection.
  - For BCG, if you are using single-dose syringes, either reusable or disposable, draw out enough vaccine for one injection. If you are using the Omega syringe, draw out enough vaccine to fill the syringe since the same needle can be used to immunize several people if it is properly flamed after each injection.
- 6.4.2 Check the vaccine in the syringe for air bubbles.
- Hold the syringe with the needle pointed upwards.
  - Tap the side of the barrel to expel air bubbles. (See Figure 21 on page 60.)
  - Depress the plunger until a little vaccine appears on the tip of the needle.
- If vaccine touches your skin or eyes, wash it off immediately.

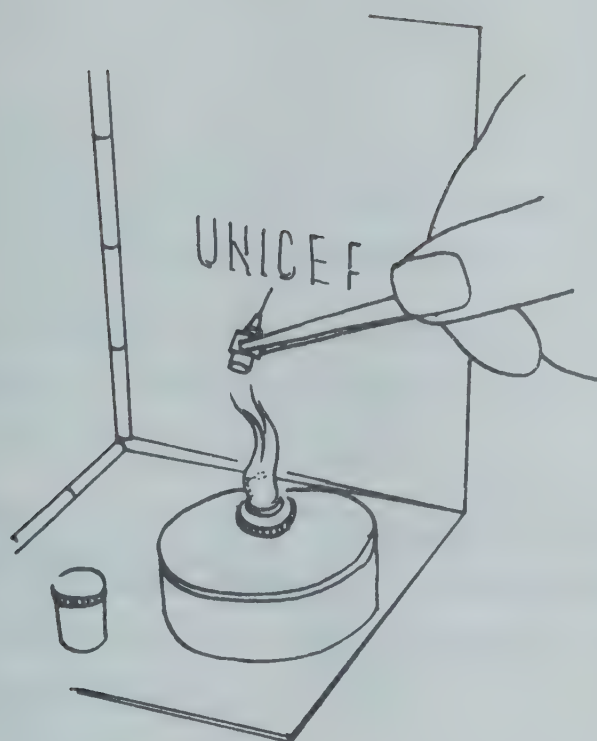


Figure 18

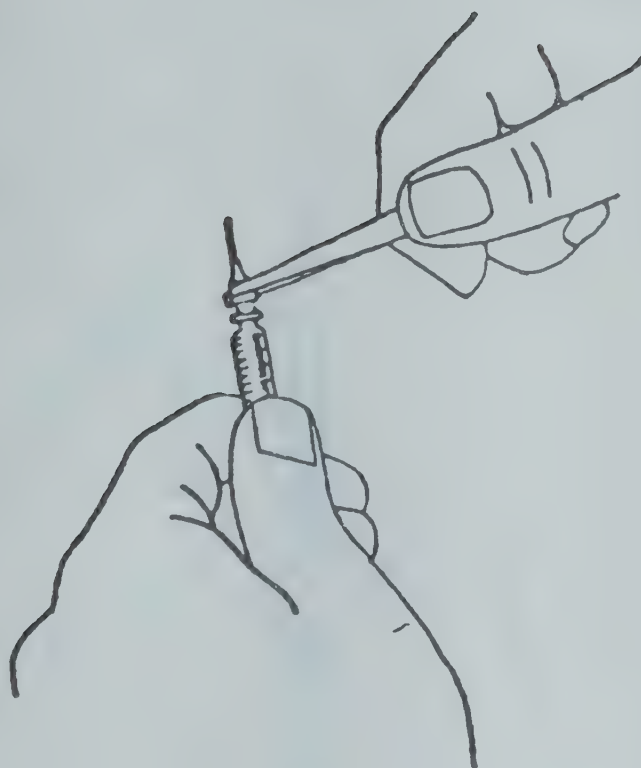


Figure 19



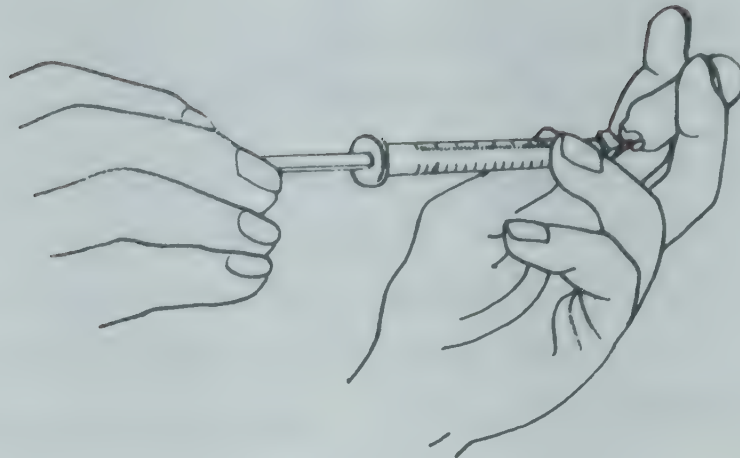
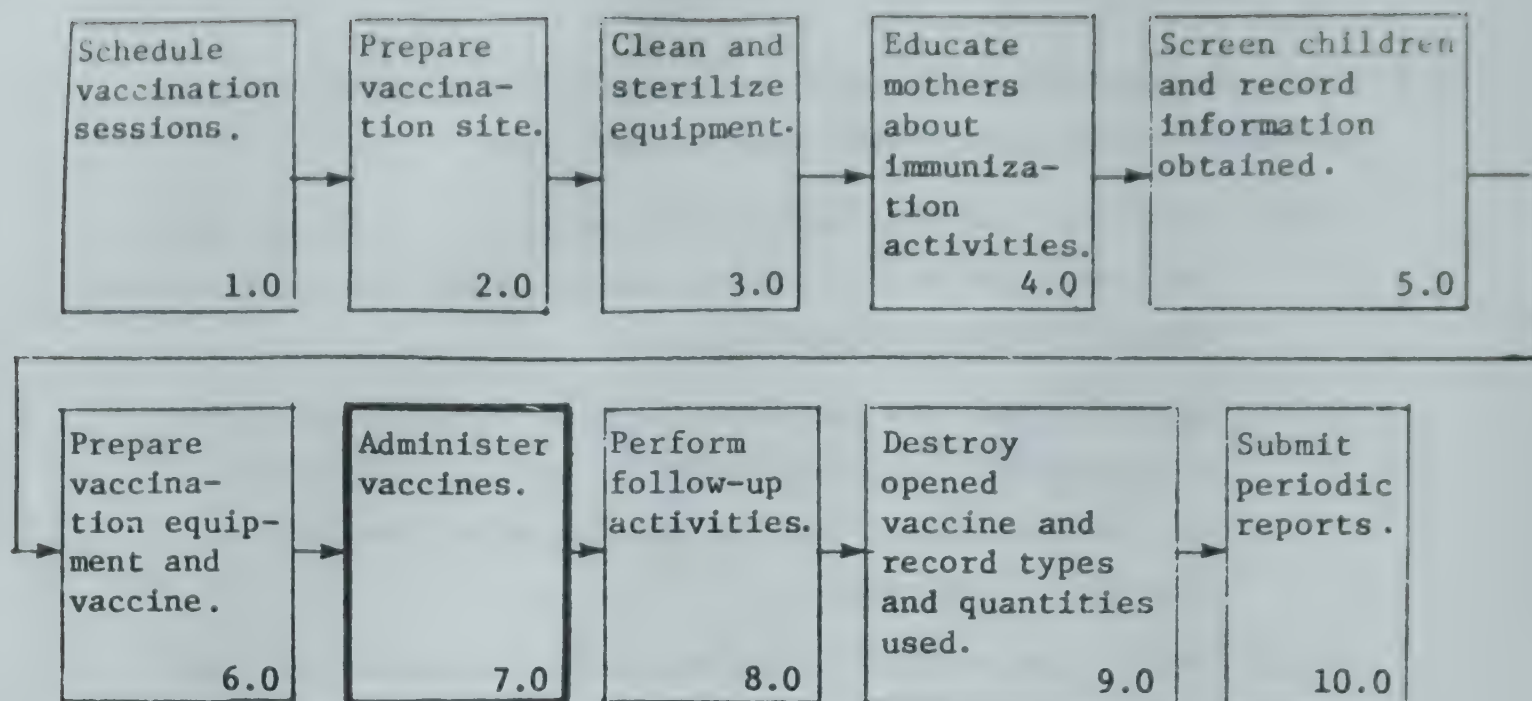


Figure 20



Figure 21

- 6.5 Keep the vaccines cold during the session since their strength decreases very quickly when they become warm.
- 6.5.1 Leave the vaccines in the refrigerator or cold box until you are ready to start vaccinating, then take out only one ampoule of the vaccine you need.
  - 6.5.2 After opening the vaccine, place it in a cup which has a mixture of ice and water in it, being careful not to tip the ampoule over or let the water rise above the top of the ampoule.
  - 6.5.3 Return the vaccine to the cup each time after you fill the syringe.
  - 6.5.4 As the ice melts during the session, be sure to empty the cup and get fresh ice and water.



## 7.0 ADMINISTER VACCINES.

### 7.1 Administer BCG vaccine (Intra-dermal injection).

- 7.1.1 Remove any of the child's clothing which may get in the way. Since a BCG scar is sometimes used as an indicator, some programmes specify which arm to give vaccinations in - BCG in one arm, measles in the other. If your programme uses BCG scars as markers, be sure to give all BCG vaccinations in the specified arm.
- 7.1.2 Ask the mother to hold the child firmly. (See Figure 22 on page 62.)
- 7.1.3 If the skin is clean, there is no need to disinfect it. If the skin is dirty, clean it with a cotton swab moistened with water or methylated spirit and let it dry.
- 7.1.4 Hold the middle of the child's upper arm firmly with your left hand, your fingers at the side of the child's body, your thumb towards you. (See Figure 23 on page 64.)
- 7.1.5 With the fingers of your right hand, hold the syringe by the barrel with the ml. scale upwards and the needle pointing in the direction of the child's shoulder. (Be sure not to touch the plunger.)



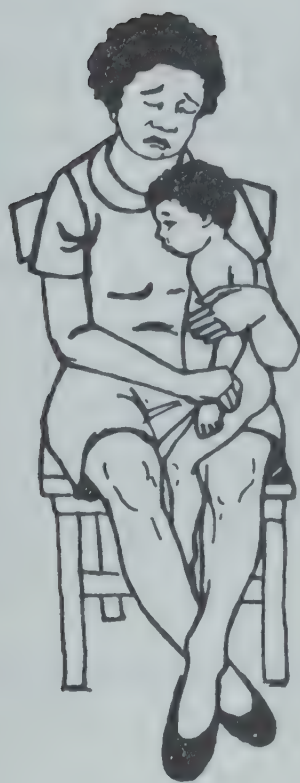


Figure 22



Figure 23

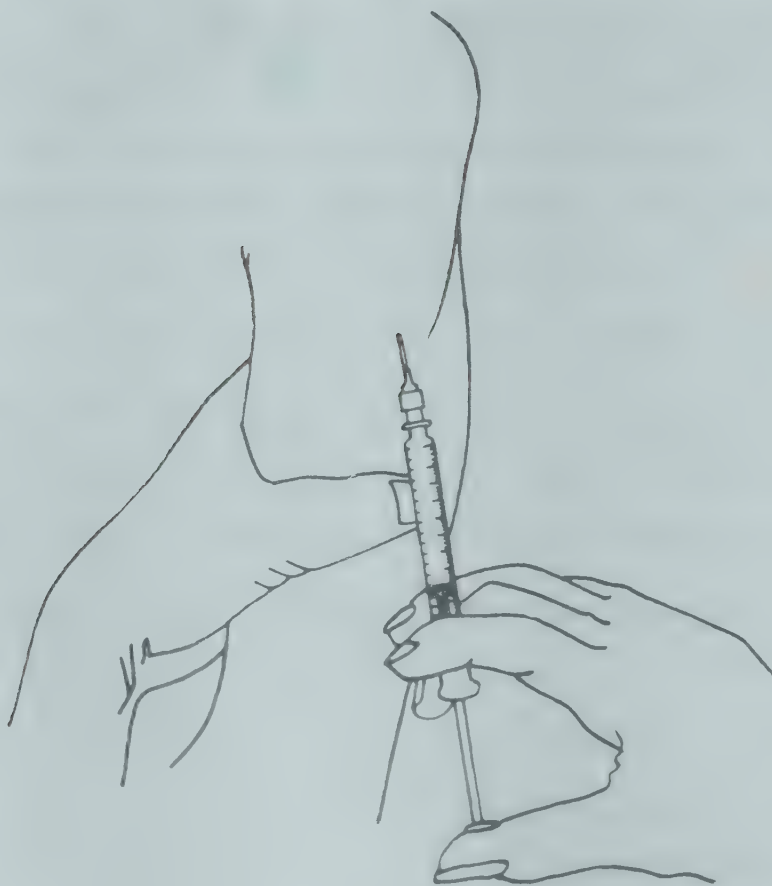


Figure 24

7.1.6 Point the needle against the skin, bevel upside, about 3 cm above your thumb. Gently insert its tip into the upper layer of the skin.

- Make sure that the needle is in and not under the skin.
- If the needle goes under the skin, take it out and inject it again.
- If you bend the needle, bend it straight with the forceps, flame and expel a few drops of vaccine, and continue vaccinating the child.

7.1.7 Holding the barrel with your index and middle finger, put your thumb on the plunger. (See Figure 24 on page 64.)

7.1.8 Holding the syringe flat, i.e., parallel with the surface of the skin, inject the vaccine.

- For children older than one year, inject 0.1 ml. (See Figure 25.)
- For children younger than one year, inject 0.05 ml.

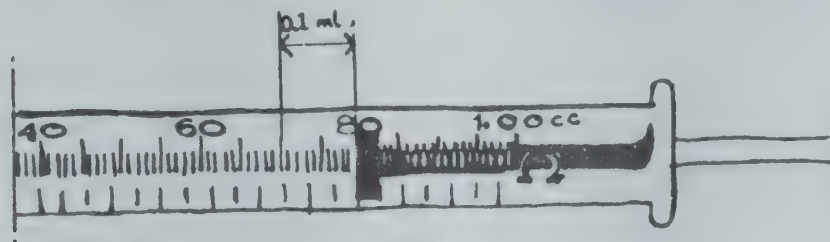


Figure 25



If the vaccine is injected correctly into the skin, a flat weal, with the surface pitted like an orange peel, will begin to appear at the injection site. An indication that the vaccine has been injected incorrectly is if a small lump forms or the skin remains flat after the injection, which means the injection went under the skin. Another indication that the vaccine has been injected incorrectly is that the plunger will move much more easily when the needle is injected under the skin than when it is injected in the skin.

If it becomes apparent during the injection that the vaccine is going under the skin, stop at once and correct the position of the needle. Administer the remainder of the dose, but no more.

7.1.9 Withdraw the needle gently.

If it becomes apparent after the full dose has been injected that the vaccine went under the skin, do not repeat the injection. Consider the child immunized.

7.1.10 Sterilize the needle after each injection by holding the tip of the needle over the flame until it starts getting red; expel a few drops of vaccine (keeping the needle pointed down and away from you) to cool the needle and to ensure that it is not obstructed. Administer the next injection.

When the syringe is emptied, flame the entire needle, up to the hub, cool and then refill the syringe.

7.2 Administer measles vaccine (Subcutaneous injection).

7.2.1 Ask the mother to hold the child firmly.

7.2.2 If the skin is clean, there is no need to disinfect it. If the skin is dirty, clean it with a cotton swab moistened with water or methylated spirit and let it dry.

- 7.2.3 With the fingers of one hand, pinch up the skin on the outer side of the upper arm. (See Figure 26.)



Figure 26

Subcutaneous Injection  
Insertion of Needle

- 7.2.4 Without touching the needle, push the needle into the pinched-up skin so that it is not pointing steeply into the arm.

NOTE: To make sure that the vaccine is not injected into a vein, slightly pull the plunger back before injection. There should be no blood in the syringe.

7.2.5 Press the plunger gently and inject 0.5 ml. of vaccine. (See Figure 27.)

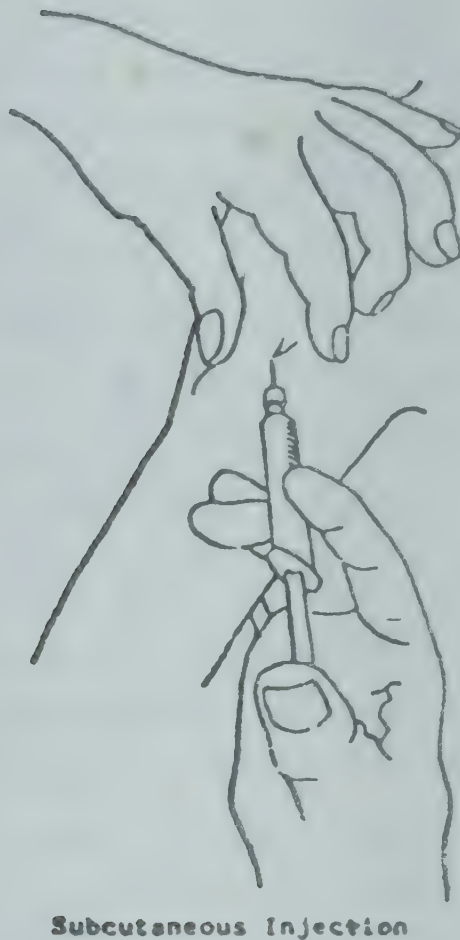


Figure 27

7.2.6 Withdraw the needle.

7.2.7 Use a new needle and syringe to vaccinate each child.

NOTE: If tetanus vaccine is being given to women, it is also given subcutaneously on the outer side of the upper arm.



### 7.3 Administer DPT vaccine (Intramuscular injection).

Administer the vaccine in the upper outer part of the thigh. (See Figure 28.) Do not inject a child under 2 years old in the buttocks because of the danger of injuring the sciatic nerve and possibly causing paralysis.

7.3.2 Ask the mother to hold the child across her knees so that his thigh is facing upwards. Ask her to hold his legs.



Figure 28

7.3.3 If the skin is clean, there is no need to disinfect it. If the skin is dirty, clean it with a cotton swab moistened with water or methylated spirit and let it dry.

7.3.4 Place your thumb and index finger on each side of the place where you intend to inject and stretch the skin slightly.

7.3.5 Quickly push the needle into the space between your fingers, going deep into the muscle.

NOTE: To make sure that the vaccine is not injected into a vein, slightly pull the plunger back before injection. There should be no blood in the syringe.

7.3.6 Pushing the plunger slowly, inject 0.5 ml. of vaccine.

7.3.7 Withdraw the needle.

7.3.8 Rub the injection spot quickly with the piece of gauze used for cleaning the skin.

7.3.9 Use a new needle and syringe to vaccinate the next child.

7.4 Administer polio vaccine (Oral vaccination).

7.4.1 To administer the vaccine, deposit 3 drops on the tongue of the child, or follow the manufacturer's instructions. (See Figure 29 on page 71.) If the child will not open his mouth, gently squeeze his nose between two fingers.

7.4.2 Use the dropper or device supplied with the vaccine.

7.4.3 Do not touch the child's lips or tongue with the dropper.

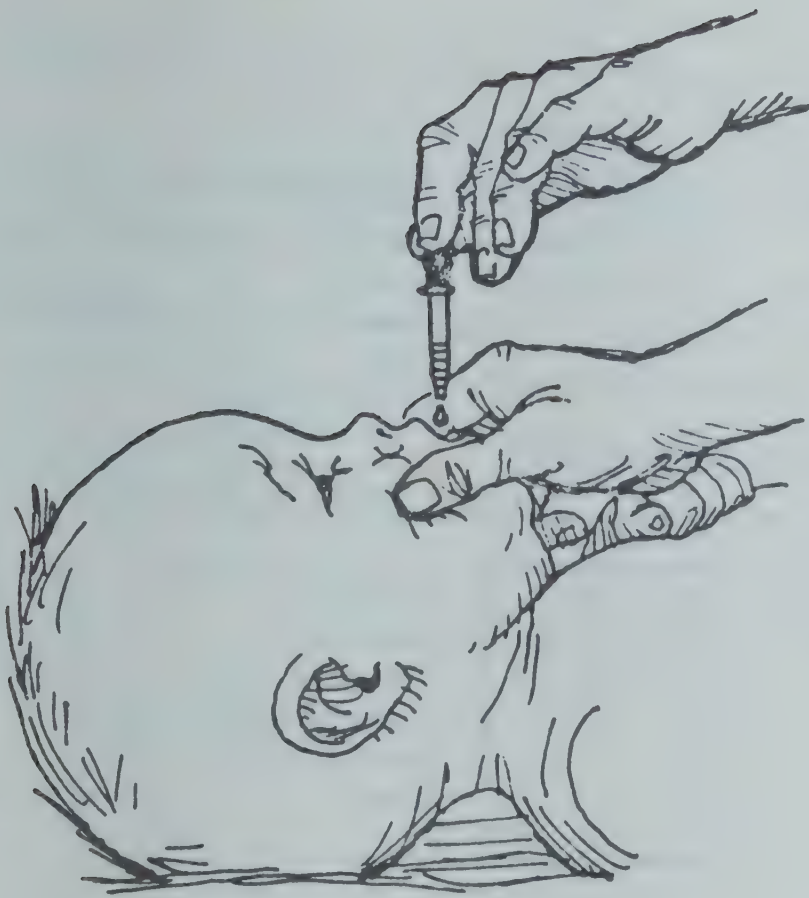
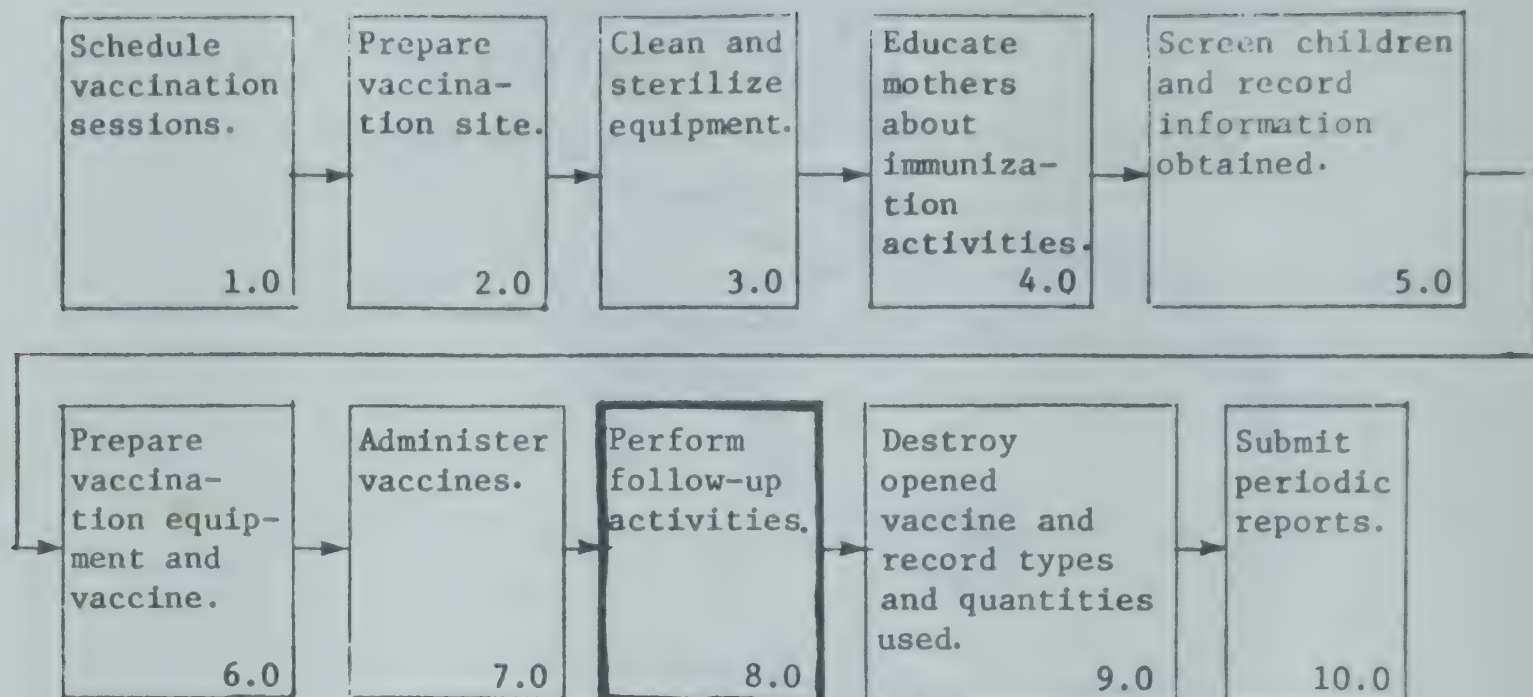


Figure 29

#### Oral Vaccination

- 7.4.4 If you do touch the child's lips or tongue with the dropper, finish giving the vaccine to that child, then discard any vaccine left in the dropper. Wash the dropper with soap and clean water and let it dry before refilling it with vaccine.
- 7.4.5 At the end of the session, destroy any vaccine that is opened but has not been used.





## 8.0 PERFORM FOLLOW-UP ACTIVITIES.

- 8.1 Check to be sure that each child has received all the vaccinations he was supposed to receive.
- 8.2 Ensure that the mothers know that reactions are possible, what they are, and what to do if they occur. (See Annex 1 on page 83 for information on reactions.)

- 8.2.1 Emphasize the safety of the immunizations.

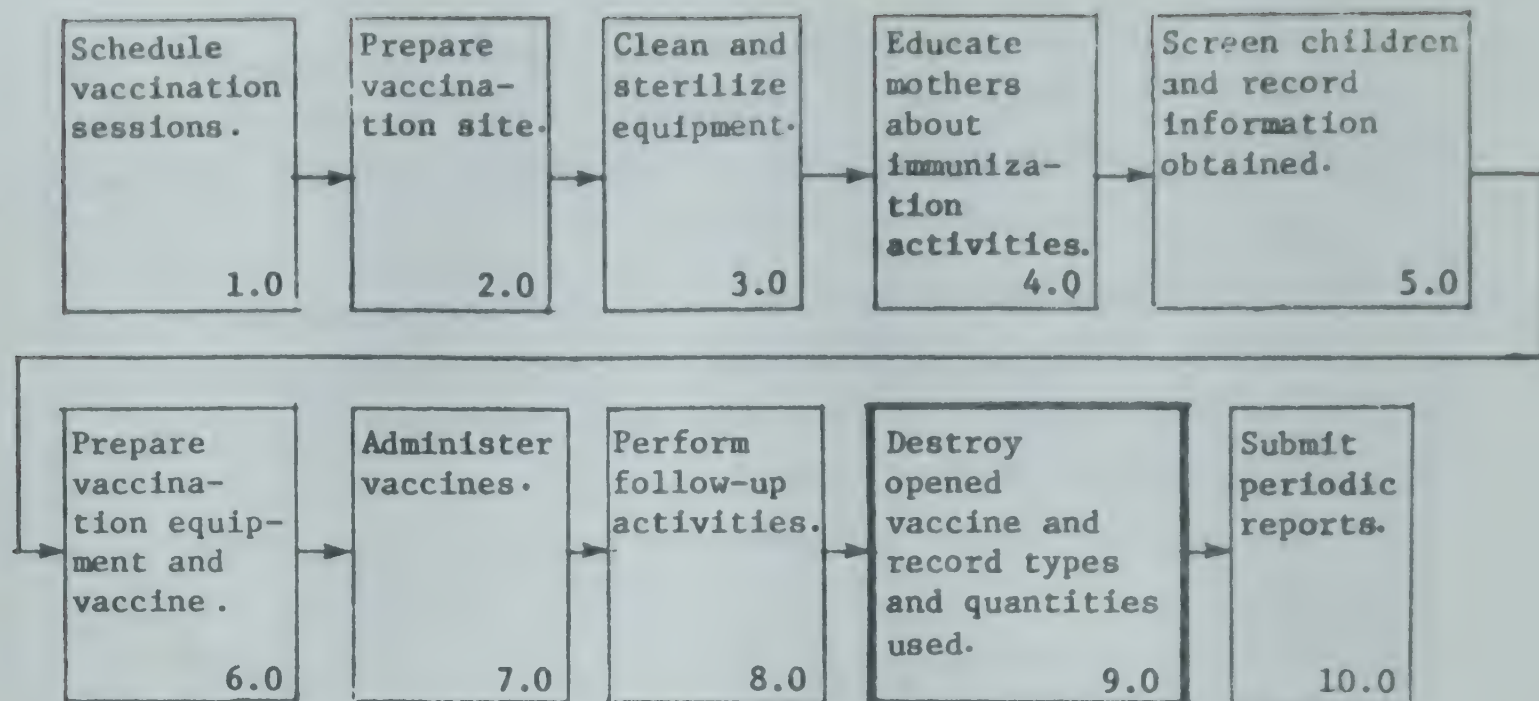
- 8.2.2 At the same time, give mild warnings about possible reactions. Explain that if a child has a reaction after the shots, this indicates that the vaccine is working and is developing protection in the child's body against the disease. Emphasize that the reactions are much milder than the disease.

- 8.3 Ensure that the mothers know when to bring their children for the next vaccinations.

- 8.3.1 Ask each mother if she knows when to return.

8.3.2 If a mother cannot tell you when she is supposed to return or tells you the wrong date, repeat the correct date to her and remind her that it is very important that she bring her child back on that date.

8.4 If the Growth Chart or Vaccination Card recommends nutritional follow-up or treatment for disease or injury, either direct the mother to the proper person or place or give her instructions on what to do.



#### 9.0 DESTROY OPENED VACCINE AND RECORD TYPES AND QUANTITIES USED.

9.1 Once a container of vaccine has been opened it must be used.  
If it cannot be used during the vaccination session, IT MUST BE DESTROYED.

9.2 Pour vaccine from opened vials onto ground or into latrine.

9.3 Break the empty vials.

NEVER KEEP OPENED AMPOULES OF VACCINE.

9.4 Record carefully and accurately in the proper place on the Vaccines Control Card the amount of each type of vaccine used.  
(See Figure 30 on page 75 for a sample Vaccines Control Card.)

9.5 If disposable syringes were used, collect them, count them, record the number used for each vaccine, and destroy them.  
Be sure that all used disposable syringes are destroyed so that a child will not be infected by an unsterile disposable syringe.

NOTE: Promptly return unopened vaccine ampoules to the health centre refrigerator.



# VACCINES CONTROL CARD

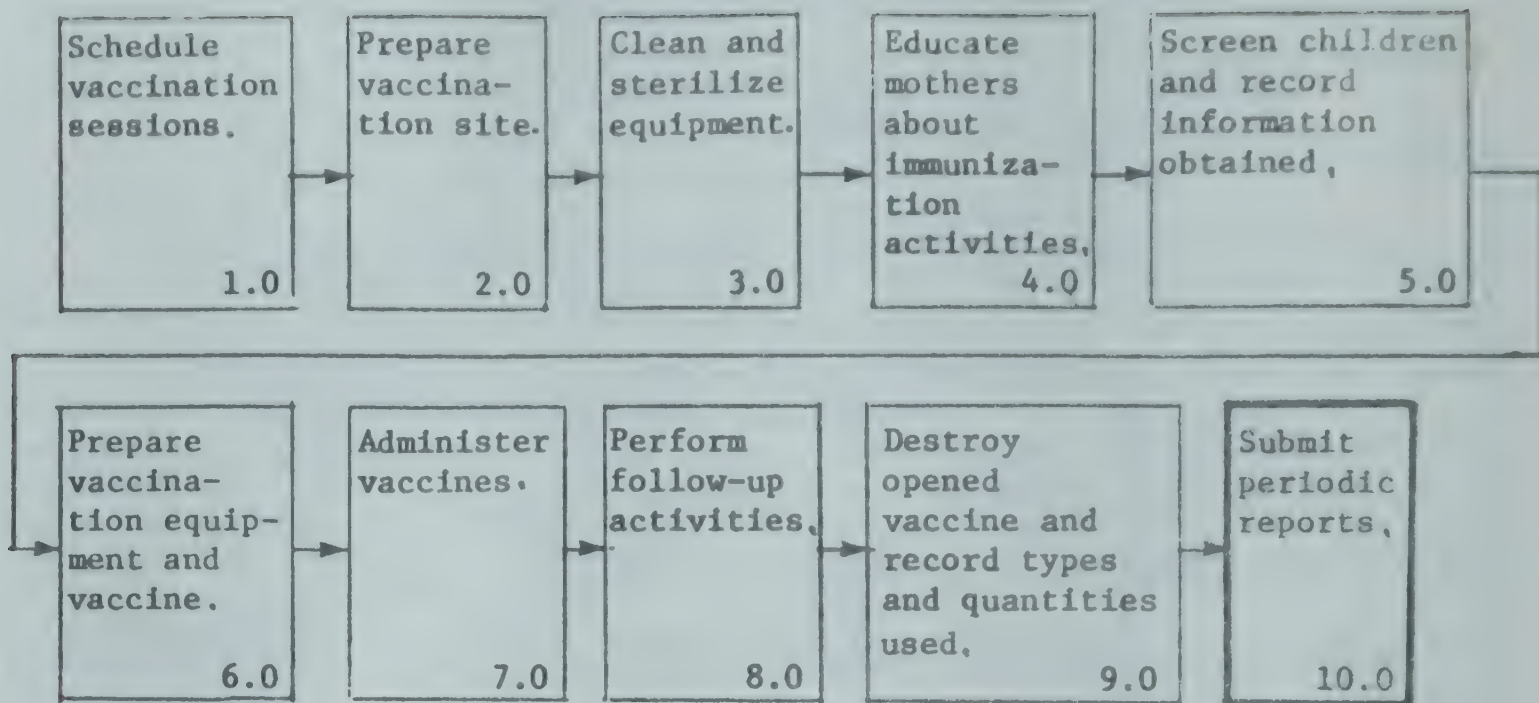
Keep these cards together in a file. Separate records for each vaccine, each type of 'doses'/container. The following is an example for countries without an existing system.

title of stores	vaccine type and doses per container
-----------------	---

[illegible]

```
*      batch expiry date
**     order book numbers
```

```
*** balance of containers in stock
**** number of containers disbursed
      or received
```



#### 10.0 SUBMIT PERIODIC REPORTS.

Once a month, submit to the Regional Supervisor of Immunization Activities one copy of the following forms:

- vaccination sessions schedules
- vaccination reporting forms (See Figure 31 on page 77.)
- vaccines control cards
- equipment and supplies control cards
- vehicle logbooks
- vehicle/motorcycle maintenance and repair forms

# MONTHLY VACCINATION REPORTING FORM

Signature: \_\_\_\_\_

Vaccination Supervisor

Dates: from \_\_\_\_\_ to \_\_\_\_\_

Place: \_\_\_\_\_

Age group Vaccines	3-5 mos.	6-8 mos.	9-11 mos.	12-14 mos.	Other children	Pregnant women	Vaccine Information				
							Doses per bottle	Number of bottles	Total doses supplied	Doses admin- istered	Doses not ad- ministered
BCG											
DPT I											
DPT II											
DPT III											
Polio I											
Polio II											
Polio III											
Measles											
Tetanus # 1											
Tetanus # 2											
Other											



### Exercise D

The course manager will set up a practical exercise so that you and the other members of your group can practice the following steps:

- clean and sterilize equipment
- educate mothers about immunization activities
- screen children and record information obtained
- prepare vaccination equipment and vaccine
- administer vaccines
- perform follow-up activities
- destroy opened vaccine and record types and quantities used

See your course manager when you are ready to begin this exercise.

## PART II: JOB DESCRIPTIONS

The sample job descriptions on the following pages present one way in which the tasks that must be performed in order to conduct a vaccination session may be divided and the position title which may be assigned to the staff member who performs each group of tasks. Although health workers have other duties to perform in addition to conducting vaccination sessions, these task groupings and position titles apply only to the roles of the health workers within the immunization activity and do not pertain to their other duties.

Ideally, all the tasks which deal with a specific function are grouped together and assigned to a single staff member. You may not have enough staff members to make these particular groupings, or you may wish, for some other reason, to divide the tasks differently and/or assign different position titles. It is neither the exact way in which the tasks are divided nor the specific position titles which are important. What is important is that each task is assigned and that each staff member knows which tasks are his responsibility.

<u>Position Title</u>	<u>Page</u>
Supervisor of Vaccination Activities	80
Vaccinators	81
Advance Person	82

## Job Description

### SUPERVISOR OF VACCINATION ACTIVITIES

1. Schedule vaccination sessions.
2. Send a copy of the vaccination sessions schedule to your supervisor and to local authorities.
3. Supervise preparation of vaccination site.
  - Select a suitable site.
  - Supervise organization of vaccination stations.
4. Supervise cleaning and sterilization of equipment.
5. Supervise education of mothers about immunization activities.
6. Supervise screening and recording.
7. Supervise preparation of vaccination equipment and vaccines.
8. Supervise administration of vaccines.
9. Supervise follow-up activities.
10. Supervise destruction of opened vaccine.
11. Prepare and submit periodic reports, forms, and copies.
12. Supervise storekeeping of vaccines and other supplies.
13. Conduct regularly scheduled staff meetings.



## Job Description

### VACCINATORS\*

1. Prepare vaccination site.
2. Clean and sterilize equipment.
3. Educate mothers about immunization activities.
4. Screen children and record information obtained.
5. Prepare vaccine and vaccination equipment.
6. Administer vaccines.
7. Perform follow-up activities.
8. Destroy opened vaccine and record types and quantities used.

\*The term "Vaccinator" is used here to describe anyone who administers vaccinations, even though this person may have other duties which are not directly related to the vaccination activities.

## Job Description

### ADVANCE PERSON

1. Meet with local leaders and health workers.
2. Explain diseases, programme, and immunization.
3. Announce dates and times of vaccination sessions to villagers.
4. Arrange for accommodations when vaccination team stays overnight in a village.
5. Visit villages on day before sessions to remind people of the vaccination sessions.

### PART III: ANNEXES

#### ANNEX 1: INFORMATION ON THE DISEASES, VACCINES, AND REACTIONS

The following information may be useful in educating the mothers.

##### CHILDHOOD TUBERCULOSIS AND BCG VACCINE

- Tuberculosis is sometimes called "dry cough."
- It is caused by small living things we cannot see (germs).
- If young children catch tuberculosis the germs may go to the brain. This may:
  - kill them
  - make them very sick
  - leave them lame if they do get better
- When a man or a woman gets this disease it makes them cough a lot. Sometimes they cough up blood.
- When sick people cough, the disease germs go into the air. Other people nearby breathe in the germs. These people then get the disease.
- Your child can get a special injection to teach his body how to fight tuberculosis. This special injection has weak germs that are different from the germs that cause tuberculosis. These weak germs can teach your child's body how to fight tuberculosis but they cannot give him the sickness.
- Your child should get this special injection before he is 1 year old. Then his body will be stronger to fight this sickness.
- Two weeks after your child gets the injection he will get a small sore on his arm. It will last for about 2 months and then go away. Do not put anything on the sore. Just keep the child's arm clean. Sometimes a child will get lumps under his arm near the place where he got the injection. These are painful and may make the child unwell, but they also go away by themselves. If they last too long, the nurse can give him medicine to make them go away faster.



- There are good medicines to treat people who get this disease, but it is best to protect them from getting it at all by giving them a vaccination when they are young.

#### TETANUS, WHOOPING COUGH, DIPHTHERIA, AND DPT VACCINE

- Tetanus kills many children by tightening up all their muscles.
- Children get it when dirt or cow or horse dung touches a sore or open cut on their body. Example: when the umbilical cord is cut with a dirty knife or razor blade or dung or dirt gets on the end of the cord.
- By getting these shots before or during pregnancy, you will protect yourself and your new baby from this disease.
- Whooping cough makes young babies cough so much they cannot eat or breathe. They often vomit and may even die.
- It goes from the sick child into the air when he coughs and into another child or baby who is close by. The child then gets whooping cough 7-10 days later.
- Diphtheria sometimes kills children by stopping their throat muscles from working so they cannot eat or breathe.
- This disease also goes from one sick child to another through the air (or from the mouth).
- Tetanus, whooping cough, and diphtheria are caused by very small living things we cannot see (germs).
- There are no good medicines to treat a child who gets one of these diseases.
- Your child should get special injections to teach his body how to fight all three of these diseases at the same time. Because his body will learn how to fight these diseases slowly, your child must get the injection three different times to make his body strong against all three diseases. If he only gets this injection once, his body will not be able to fight these diseases.
- Your baby's body can start to learn how to fight these sicknesses when he is three months old. You should bring him to the vaccination

sessions so that his body can start learning to fight the sicknesses before he catches one of them.

- After your child gets this injection, he may get a small fever for a few hours. He may get a small lump under his skin where the injection is given in his thigh, but the lump will go away in a few weeks.
- You should get two injections of tetanus vaccine to protect yourself and any babies you may have during the next three years.

#### POLIOMYELITIS AND POLIO VACCINE

- Poliomyelitis can cause lameness of legs and weakness of arms. It often kills children.
- Some children recover, and they will not get it again.
- It sometimes causes their arm or leg to shrink and become weak so they cannot walk or work well when they grow up.
- It is caused by small living things we cannot see (germs).
- It goes from one child to another child, usually by dirty hands or dirty water.
- Once a child gets polio, it is hard to help him.
- The best way to help your child fight polio is for him to get a special medicine put in his mouth. This medicine has weak polio germs that will teach your child's body how to fight polio without giving him the bad sickness.
- Your child's body will learn how to fight polio very slowly so he needs to get the medicine when he is very young and then come back to get it again two times after that. Then his body will know how to fight polio very well.
- The medicine is put in his mouth and will not make him sick at all.
- Your child's body can start learning how to fight this disease when he is three months old, so you should bring him soon after that to get his first medicine.



- When you know of a person who has polio, you should tell the health centre nurse so she can protect other people.

#### MEASLES AND MEASLES VACCINE

- Measles is a dangerous sickness. It gives children a rash and fever.
- It kills children.
- Children are often very thin and feeble after an attack of measles.
- Children who get measles and recover will not get measles again. Their body has learned how to fight it.
- Measles is caused by small living things we cannot see (germs). These germs grow in your body and damage it.
- Measles travels from one sick child to another child through the air from the nose and mouth of the sick child. After about 10 days, it makes another child sick too.
- Once a child has measles, it is hard to help him.
- The best way to help your child fight measles is for him to get one special injection when he is well. This injection has weak measles germs that will teach your child's body how to fight measles without giving him the very bad sickness.
- The injection will be given in his thigh, hip, or arm.
- Sometimes a child who gets the special measles injection will have a fever and/or rash six to ten days later which will last one or two days. This is weaker than the bad measles sickness and is no cause for alarm. It means that the special injection is teaching your child's body how to fight measles.
- You should bring your child to get the special injection when he is 9 months old. If he is too young, the special injection will not work. But if you wait too long he may get the measles sickness first, and the special injection will not be able to help him.
- When you know of a child who has measles, you should tell the health centre nurse so he/she can protect other children:



## ANNEX 2: JET INJECTORS

A jet injector automatically releases a preset dose of vaccine at high speed which penetrates subcutaneously or intradermally. Jet injectors are designed to operate with a multidose reservoir of vaccine and can give repeat shots very rapidly. For this reason the instrument is particularly suited to large numbers of persons gathered together for immunization. The rate of vaccination depends on the success in organizing a large number of persons to file past the vaccinator quickly. The rate can be as high as 3000 persons per injector per day. A single vaccinator cannot perform 3000 jet injector vaccinations per day, however, because using the gun for such a long period of time will make his arm sore. Therefore, several vaccinators will have to take turns using the jet injector if such a large number of people is to be vaccinated in a day. A common rate of vaccination is 500 people per jet injector per day. As a general rule, consider using jet injectors when there are at least 50 persons requiring either DPT or tetanus immunization in a given session. For smaller numbers, jet injectors may not prove to be worthwhile and it may be better to use needles and syringes. There are two basic types of injector presently available on the market: 1) those powered by a steel spring, and 2) those powered by compressed gas or hydraulic fluid. These two types of jet injectors are marketed by several manufacturers.

Special training is required for those using and repairing jet injectors. If jet injectors are used, ensure that spare parts are on hand as well as a Jet Injectors Operator's Guide and a Minor Repair Instructions Manual.

## Glossary

annual target population - the number of children per year in a community who are in the target age group (usually 3%-4% of the total population of the community).

biographical information - the child's name, date of birth, the parents' names, and the name of the village.

contact - a visit to a health centre or vaccination site to receive a vaccination.

contraindication - a physical condition of the child which makes vaccination improper or undesirable.

critically ill - in danger of death.

deteriorate - to become less potent or less effective.

diluent - liquid mixed with vaccine to reconstitute it before it is administered.

expel - to force out (e.g., to force vaccine out of the syringe by pushing the plunger).

immunization schedule - a list of the vaccines to be given, the desirable age at which to administer the first dose of each vaccine, and the minimum time interval between successive doses of vaccines.

immunization status - the stage of vaccination, such as fully vaccinated, partially vaccinated, or unvaccinated.

indicator - a sign that something has occurred (e.g., a BCG scar is an indicator that a child has received a BCG vaccination).

malnourished - exhibiting the physical results of an inadequate diet.

malnutrition - faulty nutrition due to an inadequate or unbalanced intake of nutrients.

monthly target population - the number of children per month in a community who are in the target age group (determined by dividing the annual target population by 12).



obstacle - a situation that delays or prevents something from happening as planned (e.g., a washed-out bridge may prevent an outreach team from reaching a village for an outreach vaccination session).

obstructed - blocked or closed up so that nothing can pass through.

outreach activities - vaccination activities conducted in villages or vaccination sites that are not within easy walking distance of the health centre.

outreach team - the group of health workers who travel from the health centre to villages or vaccination sites to conduct outreach vaccination sessions.

plot - to mark or note on as if on a map or chart (e.g., to plot a child's weight by age on the Growth Chart, Figure 12 on page 46, place a dot directly across from the child's weight and directly above the child's age).

potency - chemical or medical effectiveness.

rapport - friendliness and a willingness to cooperate.

reaction - bodily response to a stimulus (e.g., a mild fever caused by a vaccine).

reconstitute - to restore to original form a substance previously altered for preservation and storage.

sciatic nerve - nerve located near the lower back part of the hip bone.

screen - to examine methodically in order to make a separation into different groups; to select or eliminate (e.g., to determine if a child should receive vaccinations, and if so, which ones he should receive).

screeener - health worker who screens children and records information obtained

substantial - sturdy or firmly constructed.

vaccination sessions schedule - a schedule which lists the dates, times, and locations at which vaccination sessions are to be held, and any other relevant information, such as the person responsible for the vaccination session.











WORLD HEALTH ORGANIZATION  
IN COOPERATION WITH  
DEPARTMENT OF HEALTH AND HUMAN SERVICES  
PUBLIC HEALTH SERVICE  
CENTER FOR DISEASE CONTROL